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BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 27 1948

PHARMACOLOGY OF THE FAILING HUMAN HEART*

BY

JOHN McMICHAEL, M.D., F.R.C.P.

Professor of Medicine, Postgraduate Medical School of London

Digitalis and Strophanthus

It was a long time after Withering's introduction of digitalis into therapeutics in 1775 that its key position in the treatment of heart failure was recognized. Mackenzie (1905) analysed its action in the treatment of auricular fibrillation and ascribed the major benefits of the drug to its slowing effect on the heart in this condition. This view is still held in some quarters, and Lewis was long unconvinced that it had any other important action. Clinicians who used it in the treatment of failure with sinus rhythm paid a great deal of attention to its slowing action on the heart rate, and it was often held that any benefits achieved were the results of such slowing. A beneficial action on the heart independent of slowing effects, however, was postulated by observant clinicians like Christian (1919) and Gavey and Parkinson (1939). Rate reduction accompanying improvement of the circulation might in fact be the secondary result of such improvement.

The action of digitalis on the heart was a matter of considerable perplexity to pharmacologists. Cohn (1915) said that if digitalis stimulated the heart it did so by some means that pharmacological methods were unable to detect: the application of digitalis to the heart of the cat might or might not have a stimulating action. Cushny (1918) suggested that, while digitalis did not act directly on the normal heart, it had some specific action on the "malnourished" failing heart. Sir Thomas Fraser in 1890 observed: "The production (by strophanthin) of this increase in the movements of the heart . . . is significantly emphasized when the action of strophanthin is produced in an enfeebled and insufficiently acting heart. This experiment is therefore of peculiar value in demonstrating the therapeutical value of strophanthus in heart disorders." Evidence that the failing heart was stimulated by digitalis bodies was produced by the use of the heart–lung preparation by Bodo (1928), Visscher (1938), Gremels (1933), Anitschkow and Trendelenburg (1928), and others, although some workers such as Katz *et al.* (1938) produced some experimental evidence that failure of the isolated heart was uninfluenced by digitalis.

Into this perplexing confusion of ideas was thrown the observation by Harrison and Leonard (1926) that in the whole animal and in man the action of digitalis was to lower the venous pressure and with it the output of the heart. It was thus clear that there was no evidence of any stimulating action of digitalis on the *normal heart*. Although the pharmacologists had offered a useful working idea of stimulation of the *failing* heart, the questions remained: (1) Does the "failing" heart which the pharmacologist produces in his laboratory by such methods as subjection of the animal heart to the action of poisons like camphor and large doses of chloral truly represent the condition of the failing heart as seen in clinical practice? (2) What is the explanation of the lack of response in some cases of heart failure to the administration of digitalis? These were among the questions which seemed to us to demand an answer when new methods of studying the cardiac output become available.

The technique of right heart catheterization, introduced by Forssmann (1929) and developed by Cournand and Ranges (1941) for the estimation of cardiac output, constitutes the most significant advance in cardiological method in the present generation. It might be thought that by such a method, which allows the measurement of the minute volume of blood pumped by the heart and the pressures at which it does this work, the problem of digitalis action on the failing heart would be readily solved. But, like so many new methods in medicine, extensive application of the technique simply revealed that the problem of congestive failure had unrealized complexities. The clinical picture of cardiac failure with congestion and oedema is now being resolved into a number of fundamentally different groups, the mechanism of each being different from the others.

The first thing to realize is that general venous congestion may result from conditions which demand an increase in the cardiac output as well as from conditions which have long been known to impair the cardiac mechanism and which were assumed to reduce the output of the heart. We can thus subdivide cardiac failure into:

(1) *Failure with a Low Output.*—Due to hypertensive, ischaemic, and valvular heart disease.

(2) *Failure with High Output.*—Due to conditions which demand an increase in the output of the heart, such as: (*a*) diminished oxygen-carrying power of the blood—anaemia, emphysema; (*b*) metabolic disturbances—beriberi; (*c*) conditions producing a mechanical overload — arteriovenous aneurysms, Paget's disease of the bone.

In the high-output group the venous-pressure rise is not a back-pressure effect, and must rather be regarded as compensatory, the high venous pressure maintaining the output of the heart at a necessarily high level.

The reactions of these two groups to digitalis show fundamental differences. If we take emphysema heart failure as an example of the high-output group it is found that digitalis lowers the venous pressure and with it the output of the

*The Strickland Goodall Lecture delivered to the Society of Apothecaries on June 3, 1948.

heart (Fig. 1). The same type of response is seen to occur with venesection (Fig. 2). This is exactly similar to the response of the normal heart to digitalization (Fig. 3). It has long been known that digitalis reduces the venous pressure and cardiac output of normal animals and man (Harrison and Leonard, 1926; Dock and Tainter, 1930; Katz *et al.*, 1938; Rytand, 1933; Wood, 1940).

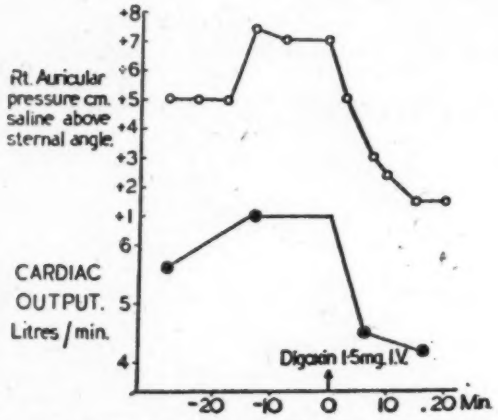

FIG. 1.—The action of digoxin in emphysema heart failure. Note that the cardiac output is raised above the normal average of 5.3 litres per minute. Digoxin lowers the filling pressure of the right auricle, and with it the cardiac output. (Reproduced by permission of *Clinical Science*.)

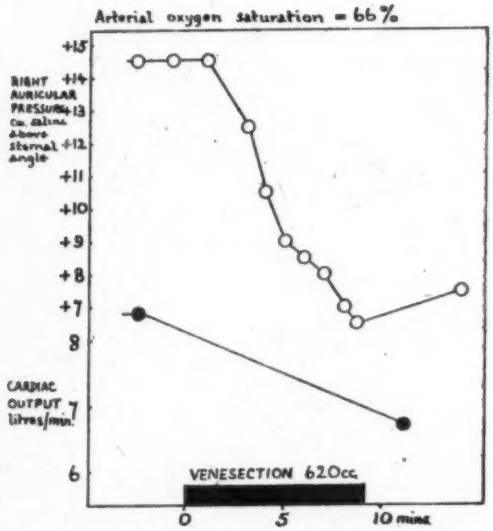
Arterial oxygen saturation = 66%
RIGHT AURICULAR PRESSURE cm. saline above sternal angle
CARDIAC OUTPUT litres/min.
VENESECTION 620cc.
0 5 10 mins.

FIG. 2.—Emphysema heart failure. The cardiac output was 8.4 litres per minute. Venesection reduced the right auricular pressure, and cardiac output fell to 6.7 litres per minute.

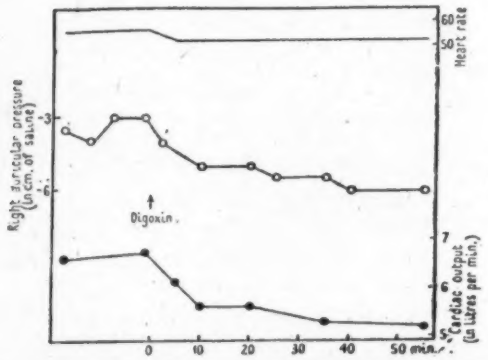

FIG. 3.—The action of 1.5 mg. digoxin on the normal heart. Right auricular pressure and cardiac output fall in parallel. (Reproduced by permission of *The Quarterly Journal of Medicine*.)

The influence of the venous filling pressure of the heart in determining the diastolic volume, and thereby the capacity of the stretched fibres for work, is a fundamental part of Starling's law: the cardiac output of the normal heart rises with an increase, and falls with a decrease, of venous pressure. Digitalis reproduces on the normal heart exactly what we would expect to happen if digitalis had a primary action on the venous tone whereby the venous pressure was reduced: the heart would diminish in size and the cardiac output would fall. It seems reasonable to postulate, therefore, that digitalis has such a primary venous-pressure-reducing action in man, and that the normally responding heart diminishes its output in response to this venomotor effect.

Digitalis, then, reduces the venous filling pressure and with it the output of the normal heart. It acts in a similar manner in most instances of high-output heart failure where the rise of venous pressure should be regarded as "compensatory."

Action of "Digoxin" in Low-output Heart Failure

If we turn now to the group of patients with heart failure and *low output*, the usual late consequence of valvular, ischaemic, and hypertensive heart disease, we find a very different state of affairs so far as the response to digitalis is concerned. The most favourable responses in this group are obtained in patients in the early stages of hypertensive and ischaemic heart disease—a point which was emphasized many years ago by Marvin (1927). In the later attacks of failure the response to digoxin steadily diminishes. At the responsive stage the injection of digoxin reduces the venous pressure, and the cardiac output rises. It would be easy to say that this is evidence of a stimulating action of digitalis on the failing heart; but simple venesection, reducing venous pressure, in these subjects will also *increase* the cardiac output. Since we already have evidence of a primary venous-pressure-lowering action of digoxin in normal man, it is necessary to see whether such an action might not be responsible for some of the effect on heart failure. Sharpey-Shafer and I (1944a, 1944b) proceeded to do this by the application of congesting cuffs to the thighs, damming back blood in the legs, thereby producing a mechanical lowering of venous pressure in the right auricle similar to that achieved by venesection. When this was done we found that the cardiac output change produced by a given venous-pressure reduction was exactly the same as that produced by a subsequent injection of digoxin when comparison of effects was made at the same venous-pressure level. This was not only true in the individual case but also when a whole series of venesections were compared with a series of digoxin observations in similar cases (Fig. 4). It is of interest to note at this point that patients with auricular fibrillation, where rate control was added to the other actions of digitalis, showed no greater or better immediate cardiac output response than the group with sinus rhythm, in whom rate reduction was slight or absent.

If our comparison of the effects of digoxin with those of mechanical reduction of venous pressure by this method is a valid controlled experiment, then it would appear that a primary venous-pressure-reducing action of digoxin might be mainly responsible, in man, for its effects on cardiac output in low-output heart failure. With digoxin we have seen no evidence against this view. It seems that the failing heart may behave in a manner very similar to Starling's overloaded heart–lung preparation, where further rises of venous pressure induce a fall in cardiac output and conversely a fall in venous pressure may be accompanied by

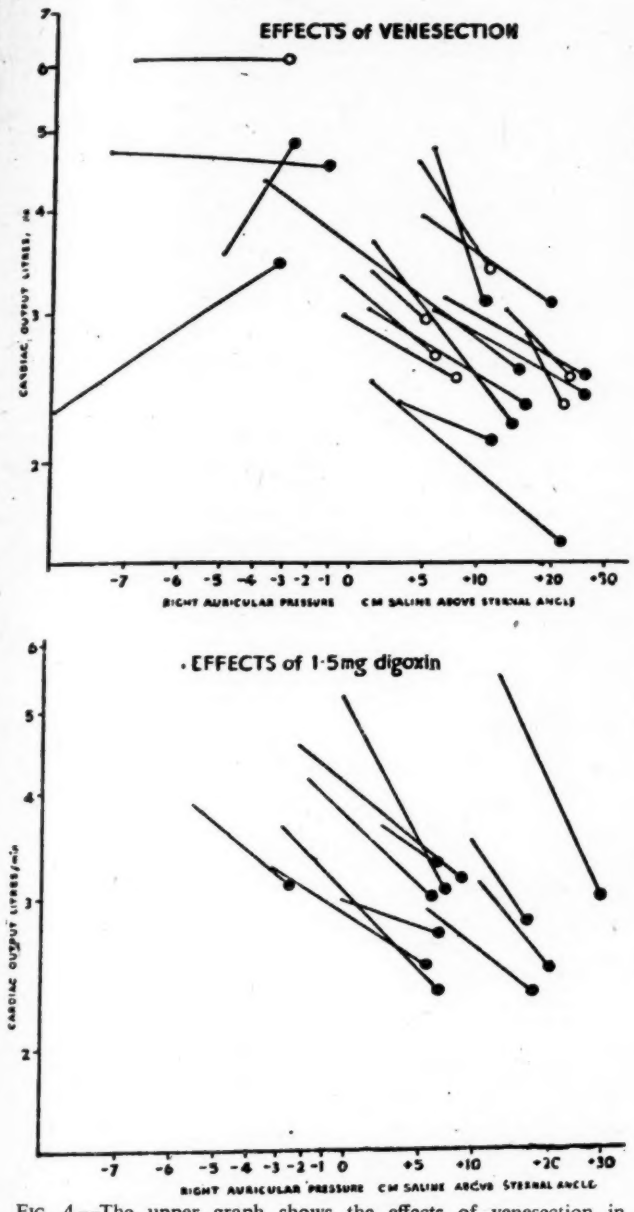
EFFECTS of VENESECTION
CARDIAC OUTPUT LITRES/min
RIGHT AURICULAR PRESSURE CM SALINE ABOVE STERNAL ANGLE
EFFECTS of 1·5mg digoxin
CARDIAC OUTPUT LITRES/min
RIGHT AURICULAR PRESSURE CM SALINE ABOVE STERNAL ANGLE

FIG. 4.—The upper graph shows the effects of venesection in lowering right auricular pressure and raising cardiac output in low-output heart failure. The lower graph shows, on an identical scale, the effect of digoxin on right auricular pressure and cardiac output in a similar group of cases. There are no significant differences. (Reproduced by permission of *Clinical Science*.)

some recovery. As a working hypothesis this enables us to explain some of the apparent failures of digoxin in clinical practice. There are advanced cases of heart failure in which the heart does not respond to venesection, and in such cases we find that it does not respond to digoxin either. We have already demonstrated that in emphysema hearts the response to digitalization is often a reduction of output. The ineffectiveness of digitalis in cases of pulmonary heart failure was recognized by Vaquez and Lutembacher (1928): death has, in fact, resulted from the use of full doses of digoxin intravenously in emphysema heart failure.

Do Digitalis and other Cardiac Glycosides have any Stimulating Action on the Failing Human Heart?

Although the effect of digitalis on cardiac output and venous pressure may be exactly simulated by simple mechanical measures reducing the venous pressure, there is in fact a difference when we consider the *work* of the heart after the two procedures. The work of the heart can be conveniently approximated for purposes of comparison by taking the product of output and mean blood pressure against which blood is ejected. Venesection is followed by a fall of blood pressure, while digoxin often produces a rise in pressure. Although the cardiac outputs are similar after the two procedures, it is clear that after digoxin the heart is doing more work than after venesection (Fig. 5). We have no easy means, however, of testing the venesected heart against an increased arterial pressure without introducing further complicating drugs. Detailed comparison of the responses, to see whether this increase in cardiac work truly indicates a stimulating action of digoxin, was not possible.

In recent months, however, we have approached this problem again, using ouabain (g-strophanthin). Two years ago it was suggested to me by Professor Rothlin, of Basle, that strophanthin might give answers which were different from those obtained by digoxin. Last year, in Boston, Drs. Bloomfield and Ellis showed me the results of a few experiments with ouabain which certainly suggested that the drug might have a direct stimulating action on the heart.

With my colleagues at the Postgraduate School we have pursued the matter further, and the present position may be stated as follows :

1. Ouabain has little measurable effect on the filling pressure or output of the normal heart.

2. It has *qualitatively* similar actions to digoxin on the failing heart.

3. In about half the cases of heart failure, however, there is a definite increase in cardiac output with only a very slight reduction of venous pressure. Detailed examination of these cases shows an undoubted cardiac stimulating action of ouabain. In the individual case the output of the heart may be raised very significantly beyond that achieved by mechanical venous-pressure reduction (Fig. 6).

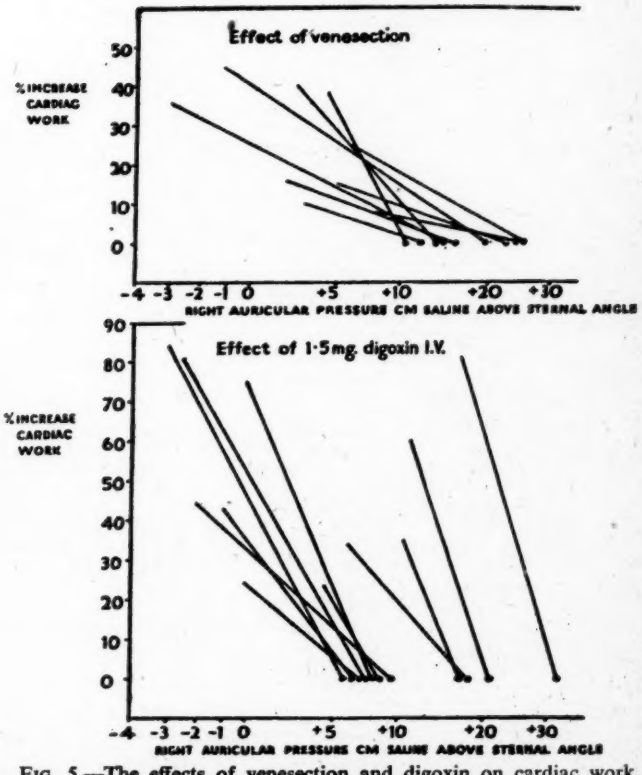
Effect of venesection
% INCREASE CARDIAC WORK
RIGHT AURICULAR PRESSURE CM SALINE ABOVE STERNAL ANGLE
Effect of 1·5mg digoxin I.V.
% INCREASE CARDIAC WORK
RIGHT AURICULAR PRESSURE CM SALINE ABOVE STERNAL ANGLE

FIG. 5.—The effects of venesection and digoxin on cardiac work (cardiac output multiplied by mean arterial pressure). The heart is doing more work after digoxin than after venesection.

4. The increases in cardiac work after strophanthin are often greater than anything seen after digoxin. This is partly the result of a greater pressor action, the rise in arterial pressure often being quite pronounced.

5. In emphysema heart failure ouabain tends to increase the output of the heart in contrast with digoxin, which very frequently lowers the output in such cases.

It seems, therefore, that ouabain has a direct stimulating action on the human heart in certain cases of failure. This stimulating action can be seen in some instances to be quite independent of any significant venous-pressure-reducing effect. Accepting analogous actions of digoxin, I think it is quite possible that the effect previously recorded of increased cardiac work after digoxin is the result of a similar but significantly weaker stimulating action on the myocardium.

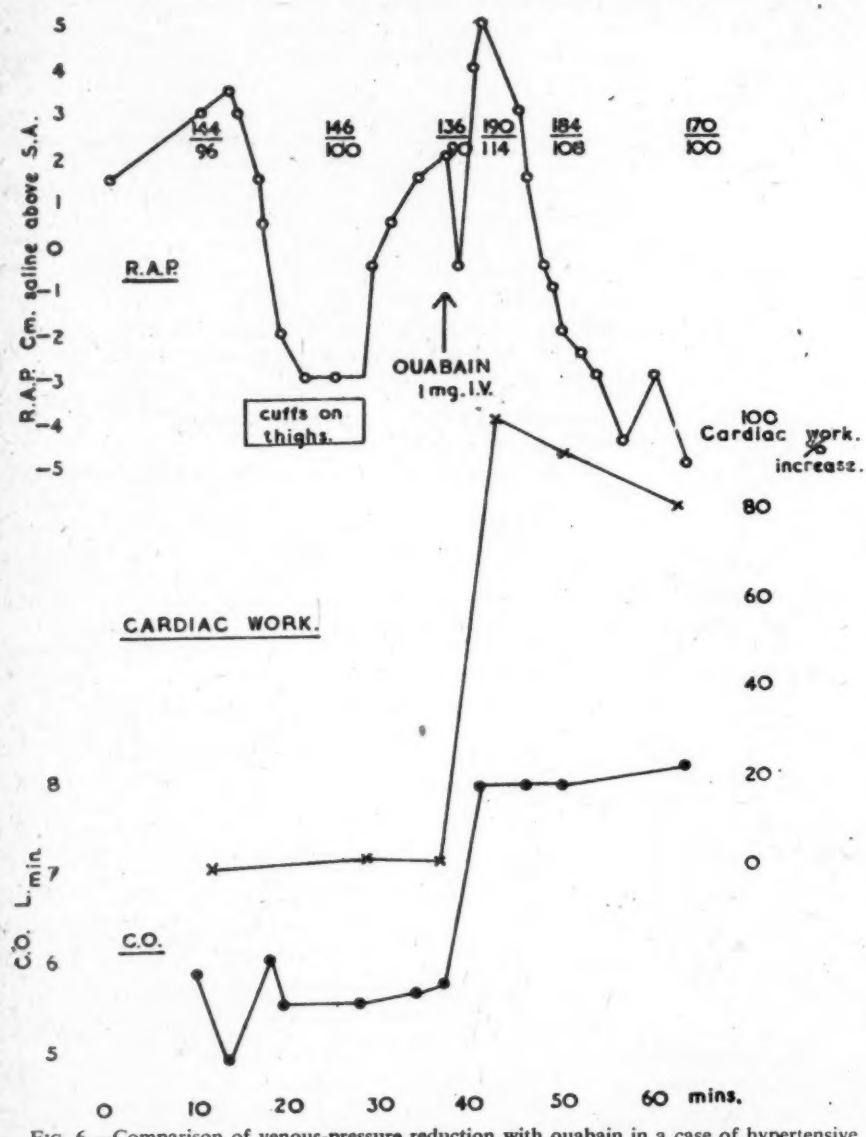

FIG. 6.—Comparison of venous-pressure reduction with ouabain in a case of hypertensive heart disease. Reduction of venous filling pressure by mechanical means (cuffs on thighs) had no significant influence on cardiac output. 1 mg. of ouabain intravenously raised the cardiac output considerably at a similar level of venous pressure (50–60 mins.). An immediate consequence of ouabain was a transient rise in arterial pressure from 136/90 to 190/114. During this phase the venous filling pressure remained high, but in spite of this cardiac output was definitely raised. This is clear evidence of a direct stimulating action of ouabain on the myocardium.

Summing up the evidence, then, leaving out effects on vagus tone and cardiac rhythm, the actions of cardiac glycosides influencing cardiac contractility are as follows:

(1) Venous-pressure-reducing action, most pronounced with digoxin, which lowers the output of the normal heart and of the heart in high-output "failure" (where the venous-pressure rise is "compensatory"). This action raises the output of the heart in low-output heart failure in a manner exactly similar to that achieved by venesection.

(2) A direct stimulating action which is seen only in certain forms of failing heart and which is significantly more conspicuous with ouabain than with digoxin. The conditions of occurrence of this stimulating action are as yet indefinable.

(3) A rate-reducing action in auricular fibrillation which does not appear to enhance particularly actions (1) and (2), but which may be an excellent guide to proper maintenance dosage when the drug is given over a long period of time.

If asked whether the venous-pressure-reducing action or the stimulating action is more important, I should have to answer under two headings: (1) So far as digoxin is concerned, it is the venous-pressure-reducing effect which predominates, for the following reasons: (*a*) In certain forms of heart failure (emphysema heart) the venous-pressure action is predominant in controlling the response and the cardiac output usually falls. (*b*) Unless venous-pressure reduction is achieved the effect of digoxin on the cardiac output is negligible. In general, the response of the heart to venous-pressure change seems largely to determine the response of the cardiac output to digoxin. (2) With ouabain, on the other hand, it is the stimulating action which tends to predominate, the venous-pressure-reducing action being weaker.

The stimulating action of strophanthin on the heart was clearly demonstrated by Sir Thomas Fraser in his monumental study in 1890. Its use in therapeutics we owe largely to the sustained advocacy of Fraenkel, ably backed by Vaquez. Vaquez claimed that the intravenous injection of strophanthin would help patients in whom digitalis had failed. Subsequently Vaquez popularized ouabain, which was of similar composition but more highly soluble in water. Vaquez summed up this situation in a manner which is completely in keeping with our recent researches He recognized the uselessness of digitalis in pulmonary heart disease, and said, "Here again, with less success, however, ouabain can be advantageously substituted for digitalis" (Vaquez and Lutembacher, 1928).

Vaquez also claimed that a few days' use of ouabain might restore the responsiveness of a failing heart to digitalis when the latter drug had apparently completely failed. I can certainly say that I have observed this sequence. Before drawing the conclusion, however, that restoration of digitalis sensitivity is specifically achieved by ouabain, I think we should keep in mind the recent work of Ray and LaDue (1945), who found that many patients who went into failure while on maintenance dosage of digitalis were in fact not receiving adequate dosage of the drug. Even in the presence of digitalis effects in the electrocardiogram, further intravenous injections of a preparation of *Digitalis lanata* might bring the failure under control. A great deal more work would therefore have to be done to prove

that ouabain is more effective than further digitalis dosage in these circumstances.

One of the reasons why strophanthin preparations have so long been neglected in this country is that they are very irregularly absorbed when given by mouth: consequently intravenous injection is necessary, and this makes their continuous use a matter of difficulty. Our own observations to date are concerned with immediate responses and do not deal to any extent with the more prolonged therapeutic use of the drug. Although it is clear that it is a potent cardiac stimulant, it has also an active blood-pressure-raising action which may actually precipitate further breathlessness after injection. It seems probable that small repeated doses may avoid this sudden extra arterial load on the heart and thus may be more beneficial than a single full dose.

Theophylline

The xanthine derivatives have had an honourable place in the therapeutics of heart failure for a long time. In the immediate past two main actions have been ascribed to them

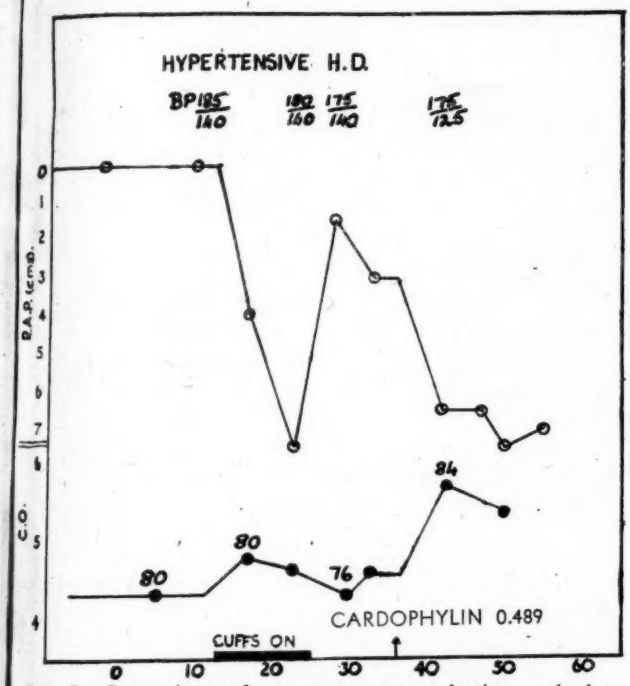

FIG. 7.—Comparison of venous-pressure reduction and theophylline-ethylene-diamine. Venous-pressure reduction produced a slight rise in cardiac output; theophylline-ethylene-diamine ("cardophylin") produced a greater rise.

—diuretic and coronary vasodilator. In combination with ethylene-diamine it has a remarkable action in the abolition of Cheyne–Stokes respiration (Marais and McMichael, 1937). Using it initially for this respiratory action, Sharpey-Schafer and I observed that it had a profound venous-pressure-lowering influence accompanied by an equally remarkable increase in cardiac output in a patient with hypertensive heart failure. We followed up that observation with a study of this action in a variety of different conditions (Howarth, McMichael, and Sharpey-Schafer, 1947). Theophylline has a stimulating effect on the normal heart as well as in heart failure; the stimulating action is better seen in hypertensive heart disease than in mitral stenosis. It also has a venous-pressure-reducing effect which may sometimes be seen to occur in mitral stenosis unaccompanied by any significant change in cardiac output. When we make a comparison between the effects on the heart of venous-pressure reduction and of theophylline there is no doubt of the direct stimulating action on the heart. When venous-pressure reduction brings about only a slight increase in cardiac output the subsequent injection of theophylline produces a much greater rise in the minute-volume of the circulation (Fig. 7). Theophylline may be given with or after digoxin with mutual enhancement of their beneficial actions.

This stimulating action of xanthine derivatives on the heart was noted by Curschmann in 1873, when he observed that the apex beat became forcible and heaving in a woman who drank a decoction of half a pound of coffee in an effort

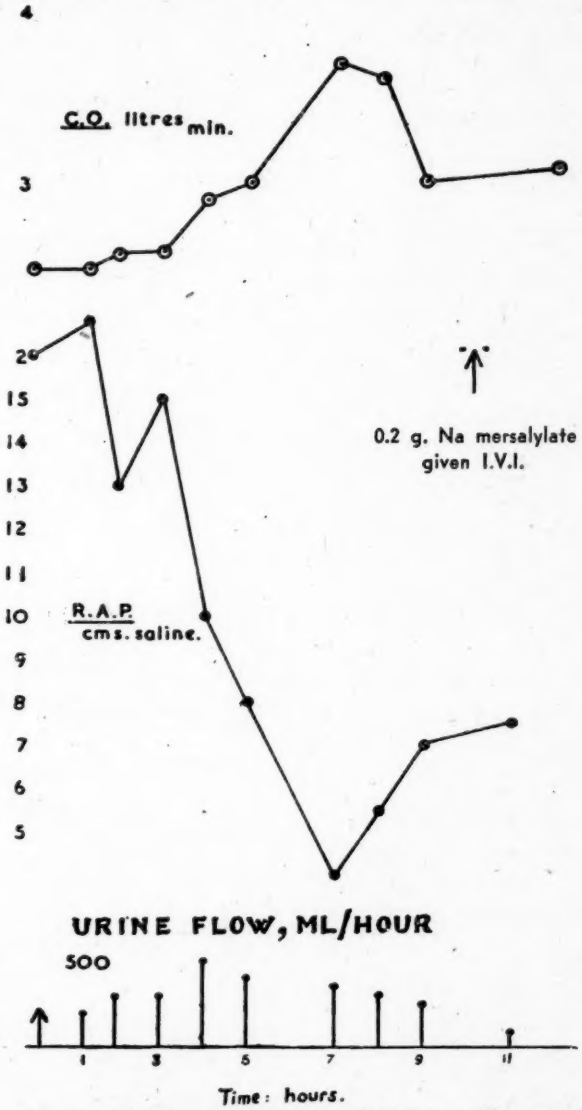

FIG. 8.—The effect of sodium mersalylate on cardiac output and right auricular pressure; 0.2 g. injected intravenously at the arrow. The diuresis reached a peak of 500 ml./hour at the fourth hour, and thereafter continued at a lower rate up to the tenth hour. By the seventh hour the right auricular pressure was considerably reduced and cardiac output had risen from 2.5 to 3.7 lit./min. (Reproduced by permission of Drs. L. G. C. Pugh and C. Wyndham.)

to produce a miscarriage. The cardiac stimulating action was also frequently noted in animal experiments, and this effect was emphasized by Boyer (1943), who thought any coronary vasodilatation seen in experimental work was a secondary consequence of the increased activity of the heart. The action of the drug is extremely rapid, coming on within five minutes of the injection. In view of the widespread use of the substance as a coronary dilator it is perhaps as well to sound a warning note that stimulation of the heart in a patient with a recent coronary thrombosis may have untoward consequences. Cases of sudden death have been reported following its use with this purpose in mind.

Theophylline, while of immense value in emergency treatment of severe heart failure, is of less value in the maintenance therapy of the cardiac sufferer. Its action tends to be transient, and when given by mouth it is often disappointing and has the further disadvantage of being a gastro-intestinal irritant. It has frequently to be discontinued on account of abdominal discomfort and diarrhoea.

Mercurials

The introduction to human investigations of the techniques of determination of kidney function in terms of renal blood flow and glomerular filtration has recently led to a bold reassessment of the part played by the kidney in the whole mechanism of heart failure. Merrill (1946) and his colleagues have shown that the oedematous cardiac patient retains far more sodium than the normal individual. Mercurial diuretics reverse this sodium retention, and for the time being the kidney gets rid of large amounts of salt as well as water.

At the Postgraduate School recently Drs. L. G. C. Pugh and C. Wyndham have made observations on cardiodynamics during the action of mercurials. As most of these mercurial diuretics contain theophylline it was necessary first to eliminate any special effects of this drug. The theophylline part of the injection does in fact have a slight venous-pressure-reducing and cardiac stimulating action, which, however, is transient. When a mercurial is injected without any theophylline diuresis follows in a period of 4 to 10 hours. At the peak of the diuresis the venous pressure is reduced and the cardiac output is raised (Fig. 8). As the diuresis passes off, the venous pressure climbs again towards the value prior to the injection. The action is very much like that of a venesection. This is the first clear demonstration of a circulatory action of mersalyl, and the value of the substance in the treatment of heart failure is further appreciated.

Discussion and Conclusion

There still exists a great deal of confusion about the meaning and significance of venous congestion, and the view is prevalent that venous congestion is a damming back of blood behind a failing pump, and that any improvement in cardiac output will automatically reduce this pressure. Against this view there are many arguments, some of which are: (1) Direct cardiac stimulation by minute doses of adrenaline below the threshold of dosage necessary to influence arterial pressure or heart rate increases the cardiac output by about 50% without affecting the venous pressure (McMichael and Sharpey-Schafer, 1944b). (2) Venous congestion is now abundantly recognized as an accompaniment of numerous circulatory disorders with a high cardiac output. (3) In normally acting hearts cardiac output and venous pressure tend to rise and fall in parallel and not inversely as would be expected on the older view. (4) Drugs like digitalis and theophylline may produce a rise, no change, or a fall in cardiac output; but, whatever the cardiac reaction, the venous pressure nearly always falls. The venous-pressure change is therefore not determined by the cardiac response but rather the reverse.

Thus it is clear that the application of Starling's law, which established venous filling as a primary regulatory mechanism in controlling cardiac output, forms a much more satisfactory working hypothesis for the consideration of the problems of circulatory dynamics in health and disease.

The lessons we have learnt from our investigations should induce a deep sense of humility. We used to believe that we were "scientific" when we subdivided the therapy of heart failure into the use of substances which acted on the heart (digitalis), while diuretics (theophylline and mercurials) were supposed to act on the kidneys. It now seems that these latter substances also act beneficially, directly or indirectly, on the circulation itself, while digitalis seems to have an important action on venomotor tone, possibly of greater significance than any direct cardiac effect. We must also plead guilty to neglect of the study of the action of the strophanthins in this country.

The sick man must be studied as a functioning whole and not as a series of isolated organs. The application of direct investigative methods to man further makes it clear that human pharmacology must stand on its own feet as a science yielding results at least as valid as those of the animal laboratory. In the latter, investigations are considerably hampered by the use of material from varying biological species and in no sense guaranteed to reproduce the conditions which obtain in clinical medicine. The story of Chassar Moir's discovery 16 years ago, by direct observations on the human puerperal uterus, of an active principle in ergot previously overlooked in decades of pharmacological work was a lesson we should not readily forget (Moir and Dale, 1932).

Clinical medicine tends to make use of many valuable measures long before their scientific rationale is fully understood. The origin in an old wives' remedy of Withering's introduction of digitalis shows that medicine has a responsibility to give fair trial to new therapeutic ideas even though their origin may be somewhat dubious. The polypharmacists who applied all remedies—digitalis, mercurials, and venesection—simultaneously to the cardiac patient probably did better for their patients than their more scientific fellows who tried to observe the actions of these substances one by one. But the blind haphazard use of drugs is equally to be deplored, and we have a predominant duty to analyse the manner in which each remedy may act.

Finally, I should like to paraphrase very slightly the words of my fellow countryman James Mackenzie (1905):

"We do not for one moment suggest that we have found out the whole matter of the action of digitalis, because there are many phenomena produced by digitalis with which we do not deal. The interpretation here given may not be found sufficient because our knowledge is very limited, and new facts are cropping up continually. . . . I have endeavoured so far as possible to give a careful record of the facts with such interpretations as appear most reasonable in our present state of knowledge."

I gratefully acknowledge the help of my colleagues, Drs. E. P. Sharpey-Schafer, Sheila Howarth, P. Wood, and, more recently, S. Ahmed, R. I. H. Bayliss, W. A. Briscoe, A. J. Palmer, L. G. C. Pugh, and C. Wyndham. The work could not have been carried to its present stage without the technical help of Messrs. A. H. Latham, R. W. Halls, and W. Manders.

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PROCAINE PENICILLIN: EFFECT OF SINGLE DAILY INJECTIONS

BY

P. F. JONES, M.B., B.Ch.
Chief Assistant, Surgical Professorial Unit, St. Bartholomew's Hospital

AND

R. A. SHOOTER, M.D.
Assistant Bacteriologist, St. Bartholomew's Hospital; Lecturer in Bacteriology, St. Bartholomew's Hospital Medical College

Among the devices for prolonging the presence of penicillin in the body, suspensions of penicillin in oil and beeswax have until recently been those most commonly used. These suspensions are apt to give rise to local reactions, for which the beeswax is blamed. A more recent preparation, also designed to prolong the presence of penicillin but thought to be free from undesirable complications, is procaine penicillin.

This substance, decribed by Salivar, Hedger, and Brown (1948) and Sullivan, Symmes, Miller, and Rhodehamel (1948), is a true salt formed by the equimolecular combination of procaine and sodium or potassium penicillin G. It has a solubility in water of 0.43%, and is administered as a suspension in oil—sesame, arachis, and cotton-seed oils all having been used. The use of oil as a vehicle enables the compound to be dispensed ready for use in a stable form, and further prolongs absorption. From the reports of Hobby, Brown, and Patelski (1948) it appears that *in vitro* and in laboratory animals it is little if at all inferior to sodium penicillin G, and the persistence of penicillin in the blood of animals following a single injection, which they describe, has been shown to occur in humans by Herrell, Nicols, and Heilman (1947), by Boger, Oritt, Israel, and Flippin (1948), and by Hewitt, Whittlesey, and Keefer (1948). Following a single injection of 300,000 units of procaine penicillin Herrell *et al.* (1947) found detectable amounts of penicillin in the blood of nine out of ten patients after 24 hours. Boger *et al.* (1948) showed that after an injection of 300,000 units of procaine penicillin in ambulatory patients detectable amounts of penicillin remained in the blood from six to thirty hours, while in patients with pneumonia the range varied from seven to seventy hours. Of 11 cases of pneumonia treated with a single injection of procaine penicillin eight required no further treatment. Hewitt *et al.* (1948) showed that after an injection of 300,000 units of procaine penicillin, out of 63 patients 58 had detectable amounts of penicillin in their blood at twenty-four hours and 21 at forty-eight hours.

Tests in a Series of Cases

This paper presents information derived from the treatment of 45 ambulant patients and four ward patients with procaine penicillin G in arachis oil.

All the ambulant patients received five daily injections of 1 ml. of procaine penicillin in arachis oil which contained 300,000 units of penicillin. No difficulty was experienced in administering the compound so long as, after shaking, it was withdrawn from the bottle with a wide-bore needle, not less than a No. 1 serum needle, and it was recognized that it would take 10 to 15 seconds to withdraw 1 ml. For administration a No. 1 hypodermic needle was satisfactory.

The ambulant patients comprised 45 persons of both sexes attending the casualty department of the hospital, their ages ranging from 17 to 83. Although ambulant in that they attended the hospital daily, the majority of them were unfit for work, and were instructed to rest as much as possible at home. In addition 12 children have been treated with procaine penicillin, the youngest aged 14 days, from whom it was not desirable to obtain blood and who are therefore not included in this report. The diseases for which treatment was given were all inflammatory in nature and included carbuncles, furunculosis, breast abscesses, cellulitis, pulp infections, and infected abrasions with lymphangitis and adenitis. The injections were said to be painless, and no local or general reactions were seen.

Penicillin blood levels were determined by the Oxford slide method, using the Oxford H staphylococcus, immediately before the second injection of penicillin in each patient, and in as many cases as possible further levels were determined before the third, fourth, and fifth injections and at approximately 24 hours after the fifth injection. The results are shown in Charts 1 and 2.

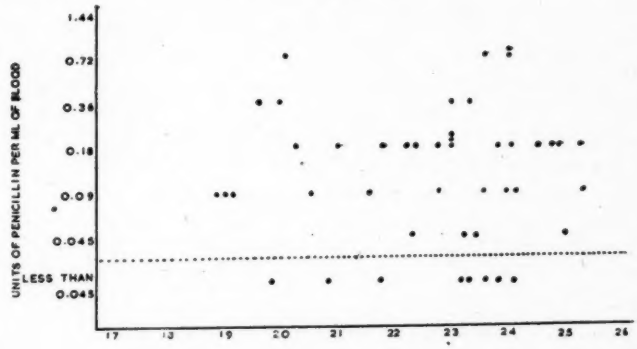

CHART 1

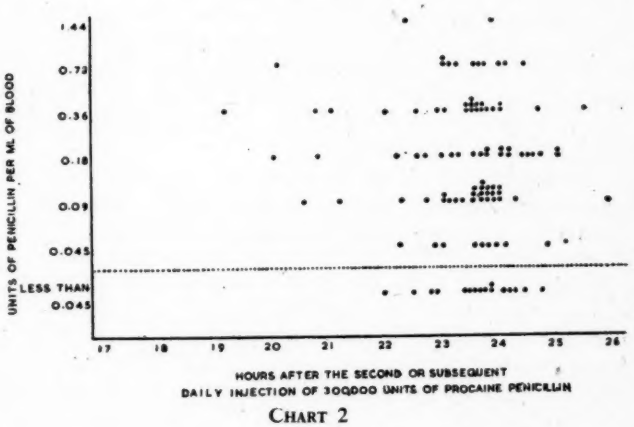

CHART 2

It will be seen that it has been possible to find detectable amounts of penicillin in the blood of 37 out of 45 patients at times varying from 18 to 26 hours after their first injection of 300,000 units of procaine penicillin. Determinations made between 19 and 26 hours after the second or subsequent daily injections have shown detectable amounts of penicillin in 93 out of 109 samples. Neither

age nor sex appeared to be a common factor accounting for the varying responses in individuals, but, in general, initial low levels of penicillin were followed by subsequent low ones and vice versa.

In one ward patient and in three ambulant patients a total of 38 penicillin estimations were made at intervals throughout 24-hour periods after injections of 300,000 units of procaine penicillin. In these patients, although the highest levels tended to appear in samples taken in the five hours following each injection, the high peak levels which occur shortly after the injection of most preparations of penicillin in oil and beeswax were not seen. The highest level reached was 1.44 units, and on the whole the amount of penicillin in the blood remained fairly constant throughout the 24 hours.

Although the series is a small one, the clinical response to this treatment has seemed to be at least equal to that seen in patients treated with injections of 250,000 units of penicillin in saline twice daily, and the clinical impression is that a number of lesions which probably would have gone on to suppuration with twice-daily injections of penicillin in saline have been aborted. It has proved possible, with one daily out-patient attendance and rest at home, to manage some patients who would otherwise have required admission.

Discussion

In the majority of 49 patients it has been possible with procaine penicillin to maintain detectable amounts of penicillin in the blood throughout treatment. There has been a certain amount of individual variation in the levels maintained. The variation noted has not been so great as that observed by Boger *et al.* (1948), and agrees more closely with that found by Herrell *et al.* (1947) and by Hewitt *et al.* (1948). Whether these variations are due to the use of the compound in different classes of patients or to variations in different batches of procaine penicillin is uncertain.

In the four cases followed more closely the release of penicillin was a gradual process, and, as pointed out by Hewitt *et al.* (1948), the high peak levels usually obtained after injections of most preparations of penicillin in oil and beeswax did not occur.

In the circumstances described here it appeared that, if it is desirable to maintain a low but constant amount of penicillin in the blood throughout treatment, this might be accomplished in the majority of ambulant patients with more certainty by means of procaine penicillin than by the use of penicillin in oil and beeswax, and with an absence of local reactions. Whether the failure of procaine penicillin to produce intermittent high blood concentrations of penicillin will constitute a drawback to its use as a therapeutic agent remains to be seen.

The number of cases treated is too small to draw any conclusions from the clinical results, but if a more extensive trial proved them to be satisfactory the use of a method of treatment with penicillin necessitating only one daily injection would allow the patient considerably more rest, and would have considerable advantages in general practice and in hospital out-patient departments. If procaine penicillin were also shown to be satisfactory for the treatment of in-patients a considerable amount of time in wards would be saved by the substitution of single daily injections for spaced three-, four-, or five-hourly injections of penicillin in saline.

As each dose of 300,000 units of procaine penicillin contains 124.5 mg. of procaine base, it is possible that those sensitive to procaine may show reactions from its use. No such reactions have yet been reported, and it is likely that, owing to the very slow rate of absorption into the circulation, toxic blood concentrations will not be reached.

Summary

Estimations of penicillin in the blood following the use of procaine penicillin G in oil in 45 ambulant patients and 4 ward patients are recorded.

In the majority of the patients penicillin could be detected in the blood between eighteen and twenty-six hours after daily injections of 300,000 units of procaine penicillin G in oil.

We would like to thank Professor L. P. Garrod for advice and criticism, Sister Surgery and the nursing staff for their co-operation, and Miss M. Rhodes and Mr. R. Andrew for technical assistance. We are indebted to Messrs. Glaxo Laboratories for supplies of procaine penicillin G in arachis oil.

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CRYSTALLINE ANTI-PERNICIOUS-ANAEMIA FACTOR IN TREATMENT OF TWO CASES OF TROPICAL MACROCYTIC ANAEMIA

BY

J. C. PATEL, M.D., Ph.D., B.Sc., M.R.C.P.
Honorary Physician, Singhanee Hindu Hospital, Bombay, India

Recently, crystalline material found to be effective in the treatment of pernicious anaemia has been isolated from liver independently in two laboratories. In America, Rickes, Brink, Koniuszy, Wood, and Folkers (1948) isolated a red crystalline material which they named vitamin B_{12} and which was shown by West (1948) to be clinically active in microgram quantities. A red crystalline substance which has been shown by Ungley (1948a) to possess in pernicious anaemia similar clinical activity to that described by the American workers has also been isolated in England (Lester Smith, 1948 ; Lester Smith and Parker, 1948).

Spies, Stone, and Aramburu (1948) treated five patients—two with pernicious anaemia, two with nutritional macrocytic anaemia, and one with non-tropical sprue—with doses of 6 to 15 μg. of vitamin B_{12}, and in all instances haemopoietic responses were observed. Spies, Lopez, Milanes, Toca, and Culver (1948) successfully treated two cases of tropical sprue with 8 μg. of vitamin B_{12}. Ungley (1948a, 1948b) found that in pernicious anaemia single doses of 10 μg. of Lester Smith's red crystalline material induced maximal reticulocyte responses and a rapid increase in red blood cells. Preliminary observations suggested that the material was as effective as liver extract in subacute combined degeneration. However, he recorded that a patient with megaloblastic anaemia of pregnancy did not respond to 65 μg. although she subsequently responded to 2.5 mg. of folic acid daily (Ungley, 1948a).

This paper reports the effect of treatment of two cases of tropical macrocytic anaemia, as occurring in Bombay, with Lester Smith's crystalline anti-pernicious-anaemia factor. The patients were admitted to the Singhanee Hindu Hospital. Detailed medical and dietary histories were obtained and thorough medical examinations carried out. The investigational procedure employed was that described

by Bhende and Patel (1946). The diet provided consisted of milk, bananas, vegetables, bread, rice, and dal. Earlier work (Patel, 1946) has shown that this diet produces no haemopoietic effect.

Haematological examinations of red cells, white cells, corpuscular volume, and haemoglobin were carried out every other day; reticulocyte counts were made daily. In each case bone marrow was obtained by sternal aspiration before treatment and on the day following the reticulocyte crisis.

Both patients received single injections of a solution containing 80 μg. of Lester Smith's crystalline factor and in both instances good responses were observed. There were pronounced reticulocyte responses. The red blood cells and haemoglobin increased and the bone marrow changed from megaloblastic to normoblastic (see Tables I and II).

TABLE I.—*Haemopoietic Response of Tropical Macrocytic Anaemia to Injection of 80 μg. of Crystalline Anti-pernicious-anaemia Factor.*

Case No.	R.B.C. (millions per c.mm.)		W.B.C. (per c.mm.)		Haemoglobin (g. per 100 ml.)		Reticulocytes	
	Initial	After 14 Days	Initial	After 14 Days	Initial	After 14 Days	Day of Peak	%
1	1·68	2·56	4,100	6,500	8·65	11·24	6	11·5
2	1·76	2·56	2,500	4,600	6·92	9·51	5	36·8

TABLE II.—*Response of Bone Marrow to Treatment with Crystalline Anti-pernicious-anaemia Factor.*

	Case 1			Case 2		
	Before Treatment	After 7 Days		Before Treatment	After 6 Days	
Proerythroblast ..	1·0	0·4		1·0	0·4	
Megaloblast Type 1	1·0	0·0		13·0	0·0	
Megaloblast Type 2	4·2	0·0		12·2	0·0	
Megaloblast Type 3	6·4	1·2		2·4	3·4	
Megaloblast	11·6	1·2		27·6	3·4	
Normoblast Type 1	0·0	0·0		0·2	1·0	
Normoblast Type 2	2·6	2·8		0·0	8·0	
Normoblast Type 3	5·0	28·8		13·2	44·4	
Normoblast	7·6	31·6		13·4	53·4	

Case 1

A male shop assistant aged 42, of poor economic status, was admitted because of general weakness of twelve months' standing which had increased during the past seven months and which had prevented him from working for three months. For twelve months he had passed two to three stools daily and there had been much flatulence and pain in the left side of the abdomen. Stomatitis had been present throughout and was more severe during the seven months before admission. He had suffered from giddiness and palpitation for three months; there was no paraesthesia. The family history was negative and there had been no previous illness of any significance. He was a vegetarian, and had been on a self-imposed starchy diet on account of "indigestion." He stated that he had been treated with some liver preparation two months before admission.

When admitted he was emaciated and pale and his skin was sallow. There was nothing abnormal in the respiratory or nervous system. The tongue was pale and smooth and there was no abnormal sign in the abdomen. The urine and stools showed no abnormality, and the blood Wassermann reaction was negative. Gastric analysis (oatmeal) revealed the presence of free hydrochloric acid. The blood picture before treatment was as follows: red cells, 1,680,000 per c.mm.; haemoglobin, 8.65 g. per 100 ml.; white cells, 4,100 per c.mm.; M.C.V., 140 c.μ, M.C.H.C., 36%. The differential leucocyte count showed: polymorphonuclear leucocytes 55%, eosinophils 4%, mononuclears 2%, and lymphocytes 39%. The indirect van den Bergh reaction was negative, and the icterus index 7 units. After the injection of 80 μg. of crystalline anti-pernicious-anaemia factor a reticulocyte maximum of 11.5% occurred on the sixth day, and after 14 days the red blood cells had increased to 2,560,000 per c.mm., the haemoglobin to 11.24 g. per 100 ml., the white cells to 6,500 per c.mm.; the M.C.V. was 125 c.μ, and the M.C.H.C. 34.5%.

The marrow was examined before treatment and seven days after the injection; Israël's (1939) terminology was used. The results given in Table II show that the treatment resulted in a change from megaloblastic to normoblastic.

The patient's appetite began to return on the third day after the injection, and by the sixth day had increased tremendously. His diet consisted now of bread, bananas, and milk. His weight increased from 91 lb. (42.27 kg.) on admission to 97 lb. (44.99 kg.) after one week. In spite of this improvement in general condition and blood picture he developed an attack of stomatitis ten days after the injection which prevented him from eating bread and bananas, and hence he lost 3 lb. (1.36 kg.) during the second week. However, his general appearance had improved considerably.

Case 2

A schoolboy aged 16 was admitted suffering from general weakness, loss of appetite, and stomatitis, which had persisted for two months; there had been low fever for one month. He had had an attack of dysentery at the age of 10, and since then he had had intermittent pain in the abdomen and diarrhoea. Six months before admission he had had a recurrence of dysentery, for which he was given a special diet and received symptomatic treatment. There was another attack of diarrhoea three months before admission, and the symptoms for which he was admitted dated from about that time. He had received no liver therapy. For the last two months he had suffered from flatulence and passed one or two loose stools in the morning. On account of this he had restricted his diet to rice and curdled milk. There was nothing of importance in his family history.

He was pale and sallow. On examination no abnormality was detected in his respiratory, cardiovascular, nervous, or alimentary system. Urine was normal; the stool examination showed Charcot–Leyden crystals, with vegetative forms of *Trichomonas hominis* but no other protozoa or ova. The Wassermann reaction was negative; gastric analysis (oatmeal) revealed the presence of free acid. The blood picture before treatment was as follows: red cells, 1,760,000 per c.mm.; M.C.V., 105.1 c.μ; M.C.H.C., 37.4%; haemoglobin, 6.92 g. per 100 ml.; white cells, 2,500 per c.mm. The differential leucocyte count was: polymorphonuclear leucocytes 58%, eosinophils 4%, basophils *nil*, large mononuclear leucocytes *nil*, lymphocytes 38%. The van den Bergh reaction (direct and indirect) was negative; the icterus index was 5 units. He was given a single injection of a solution containing 80 μg. of crystalline anti-pernicious-anaemia factor. A reticulocyte maximum of 36.8% occurred on the fifth day. Appetite began to return on the third day, and on the fourth day he felt very hungry. He was given a diet of bananas, bread, and milk, and in 14 days he increased in weight by 8 lb. (3.63 kg.).

The blood picture on the fourteenth day after the beginning of treatment was: red cells, 2,560,000 per c.mm.; M.C.V., 101.5 c.μ; M.C.H.C., 36.5%; haemoglobin, 9.51 g. per 100 ml.; white cells, 4,600 per c.mm. The marrow, which was megaloblastic before treatment, had become normoblastic six days after the injection (see Table II).

Summary

Two cases of tropical macrocytic anaemia showed good responses to treatment with 80 μg. of Lester Smith's crystalline anti-pernicious-anaemia factor.

I wish to thank Dr. R. Row, Honorary Director of the Singhanee Hindu Hospital, for facilities for this work. The crystalline anti-pernicious-anaemia factor was provided by Dr. E. Lester Smith, of Glaxo Laboratories, Ltd.

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INOCULATION HEPATITIS

BY

H. MALMROS, M.D.
Physician-in-Chief

O. WILANDER, M.D.
Head of the Clinical Laboratory

AND

B. HERNER, M.D.
(From the Central Hospital, Örebro, Sweden)

As is well known, the name "homologous serum jaundice" is still often employed, though it is in some way misleading. The term "jaundice" ought to be replaced by "hepatitis," as the disease is due to a virus infection that produces the same symptoms as common epidemic infective hepatitis. The virus is already present in the blood during the pre-icteric period and can be transferred not only with the serum but, of course, also with plasma and whole blood. The term "haematic" or "haematogenous" hepatitis has therefore been proposed. As the virus which produces this disease is not completely identical with that responsible for epidemic infectious hepatitis, the distinctive terms hepatitis of type A and B respectively (MacCallum) or X and Y disease respectively (Beattie and Marshall) have also been suggested.

It may appear to be of no consequence which designation is chosen. This is by no means the case, however, for the power of language over thought is such that we are apt to obtain a fallacious conception of the nature and paths of infection of the disease by employing a term that has reference to only one of the many spreading possibilities of the infection. Nor should we class the disease as B or Y, for such a designation may easily occasion confusion with A or X and, moreover, is quite certainly meaningless. In the Scandinavian literature the term "inoculation hepatitis" is used. As will be shown below, this is a fully adequate expression and also an appropriate name, since it warns physicians and other hospital staff of the risk of transferring the disease by inoculation from one patient to another.

Early Observations on Diabetic Patients

As early as 1925, at a Scandinavian congress in Stockholm, one of us (Malmros) drew attention to the risk of infection to which patients were exposed when blood samples were taken. During the year 1923 Malmros had an opportunity of observing an epidemic of hepatitis among diabetic patients who were being attended in the Medical Clinic of Lund. He was then able to establish the fact that the infection was probably transmitted at visits of the patients to the laboratory, for cases also occurred among patients who had not been admitted to hospital but had incidentally visited the laboratory for blood tests. For such cases as well as for patients who had fallen ill after being discharged from hospital the period of incubation could be estimated at about three months. Most of the patients had not been treated with insulin, and hence it may be taken that the insulin injections had not played any part in the origin of the disease. The patients had not received blood transfusions or other injections either. Altogether the epidemic embraced 34 cases, 28 of which were diabetics. Among the population in general there was no extensive hepatitis epidemic at this time.

Transference of Infection in Blood-sampling

After exhaustive studies of the various possibilities for transmission of the infection we finally came to the decision that the virus of the disease had been unintentionally transferred by inoculation from one patient to another in connexion with samplings for the blood-sugar analyses. For these analyses capillary blood was used, which was obtained by pricking the finger or the lobe of the ear with a "blood-gun." The same instrument had been employed on several patients and had only been hastily cleaned by wiping it with an ether swab. Three months after the attention of the laboratory staff had been drawn to the risk associated with this unsuitable technique the epidemic came to an end.

Amassed cases of hepatitis in diabetics have subsequently also been described by other authors (Steinitz, 1931, 1932; Bade, 1936; Graham, 1938; Stockinger and Wenzel, 1938; Ducas and Uhry, 1939; Selander, 1939; Vannfält, 1944; Odin, 1945; Droller, 1945). Most of these have come to the conclusion that the cause of hepatitic cases among diabetic patients is the transmission of the infection in connexion with the blood-sampling. Of particular interest are Selander and Odin's observations of the occurrence of hepatitis among patients who had been attended earlier in hospital. In the city of Gothenburg, in Sweden, all cases of jaundice have been notifiable since 1901, and this has enabled a good survey to be kept of the epidemiological situation during the past years. In Selander's material, which comprises 960 cases from 1924 to 1938, there were 274 "return" cases—i.e., patients who had been attended in hospital the year immediately before contracting hepatitis. Of this number 47 were diabetics. The period of incubation for these return cases was generally two to three months. The risk of contracting hepatitis was estimated to be 40 times greater for patients who had been in hospital than for the rest of the town's inhabitants. After Odin had carried rigorous prescriptions into effect as regards sterilization of the syringes and lancets used for blood-sampling the number of return cases diminished considerably; indeed, they almost terminated completely.

It is accordingly clear that the epidemic as well as the sporadic appearance of hepatitis can be due to transmission of the virus from one person to another in connexion with interventions of various kinds undertaken by physicians and other members of the hospital staff. We have to reckon with there being risk of inoculation hepatitis associated with: (1) serum, plasma, and blood transfusions; (2) protective inoculations for which serum, lymph, or some other biological material derived from human beings is used; (3) intravenous injections if a syringe earlier used for other patients is re-used without proper sterilization; (4) intramuscular injections, which may also constitute a risk in that blood or tissue fluid that is under a certain pressure can produce a reflux through the injection needle into the syringe; (5) blood-sampling, whether of venous or of capillary blood.

A Special Sampling Instrument

That there is a risk of transmitting the virus of hepatitis by the use of a so-called blood-gun that has not been carefully sterilized after each use is evident from the above-mentioned hepatitis epidemic in Lund. Quite naturally it is not only diabetics that are liable to be infected at blood-sampling. Patients are also exposed to this risk at so simple and common a test as a haemoglobin determination. Experience has shown that it is very difficult to achieve a fully reliable sterilization of blood-guns. Washing with ether, alcohol, or other disinfectants is not sufficient. For this reason we have tried out a special sampling instrument into which a fresh sterile needle is fitted for every patient (see Fig. 1). The instrument consists simply of a holder for Miller needles like that used by dentists in the treatment of the root-canal. Gramophone needles are used instead of the long slender Miller needles. Flat needles are the best, but the ordinary round ones will also do. After use they are washed in alcohol and dry-sterilized.

Mendelssohn and Witts (1945) have made a close study of the risk of spread from venepuncture with syringes that are washed but not sterilized. With a syringe containing methylene blue they punctured a rubber tube through which water was running, pointing the needle in the same direction as the water was flowing. They were able to show that as soon as the negative dynamic pressure caused by the flow of water becomes higher than the hydrostatic pressure the contents of the puncturing-syringe are drawn by suction into the water flowing through the rubber tube, whereupon the water is stained blue.

As it seemed to us highly desirable for this important problem to be further elucidated, we repeated Mendelssohn and Witts's experiment, but altered the experimental conditions somewhat to bring them into closer accord with the physiological conditions. By direct measurement we convinced ourselves that following constriction the venous pressure can rise to 1,200 mm. H_2O. When the tourniquet is loosened the blood starts to flow and the venous pressure falls rapidly. Mendelssohn and Witts did not take this into account in their model-experiment, but on the whole kept the same hydrostatic pressure during the entire experiment.

In our experiment we employed an approximately 1½-metre-long narrow transparent plastic tube, which was filled with water through a funnel. At the beginning of the experiment the outflow was closed with a clamp and the other end of the tube was raised to a height of about 1,200 mm. The horizontal part of the tube was punctured with a needle fitted to a sedimentation syringe of Westergren's model con-

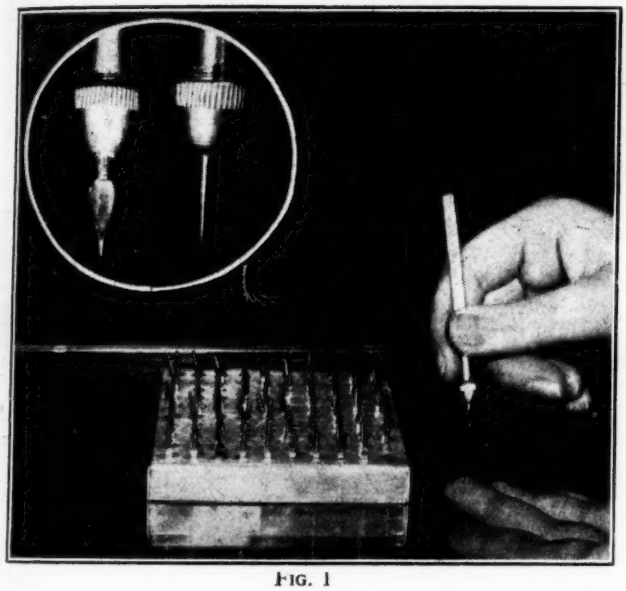

FIG. 1

taining methylene-blue solution instead of sodium citrate. The clamp was thereupon opened to allow the water to flow through the tube, and the hydrostatic pressure was simultaneously reduced to normal venous pressure (40–80 mm. H_2O) by lowering the funnel. With this experimental arrangement we were unable to demonstrate any suction of methylene blue into the water from the syringe.

However, as we considered it to be theoretically possible that Mendelssohn and Witts's interpretation was correct in spite of this, we repeated the experiment with a somewhat altered technique and then used a more sensitive indicator than methylene blue. The experiment was carried out in a dark room in which the source of light consisted of an ultra-violet lamp with a black filter (wavelength *c.* 3,650 Å). A 20% sodium fluorescein solution was drawn into the syringe. Under ordinary light this solution has the appearance of a brown-coloured fluid. Under ultra-violet light, on the other hand, even the smallest trace of it when mixed with water gives an intensely bright yellow colour that can be distinctly seen even through a plastic membrane. Before the puncture a needle (previously never used) was fitted to the syringe. With these experimental dispositions we succeeded in showing that a few seconds after water started to flow through the tube a stream of fluorescein solution issues—like a streak of fire—from the tip of the needle (see Fig. 2). Alteration of the hydrostatic pressure by alternately

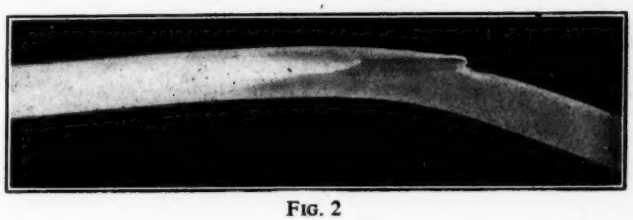

FIG. 2

raising and lowering the funnel disclosed that the inflow from the syringe sometimes ceased and then increased again when the pressure conditions were reversed.

With the aid of fluorescein solution we have also been able to show that in certain cases fluorescein is forced out of the syringe through the whole needle when the latter is fastened to the syringe. In the ultra-violet light the small drop of fluorescein is then seen to gleam like a glittering pearl in the outlet of the syringe-needle. We were able to produce this phenomenon in only a few solitary instances, and the condition necessary for its appearance was that the needles had been sterilized by boiling so that they contained a little drop of water when they were fitted into the syringe. However, dry sterilization of the syringe-needles does not afford protection against suction as a result of a negative dynamic pressure, for even in those cases in which we made use of entirely dry needles we obtained a distinct fluorescein streak in the flowing water.

Comment

These experiments make it obvious that there is a risk of transferring the infection in all those cases in which inefficiently sterilized syringes are employed for venepuncture. This established fact plainly involves serious consequences, for the great majority of physicians have hitherto used the same syringe for many patients—e.g., at blood-samplings for the sedimentation test. If we wish to ensure that our patients are not exposed to any unnecessary risks we must make it clear to ourselves and to our nurses and other hospital staff that infection is liable to be transmitted as soon as we use a non-sterile syringe. In times of peace the provision of a satisfactory number of syringes is merely a financial problem that ought not to be allowed to stand in the way of securing for our patients an effective protection against a serious and completely unnecessary disease. As a matter of fact, with some training it is possible in many cases to perform venepuncture solely with an acupuncture-needle without using syringes and to let the blood drip into a test-tube.

Summary

Risk of inoculation hepatitis is present at: (1) serum, plasma, and blood transfusions; (2) protective inoculations with human serum or lymph; (3) injections, intravenous as well as intramuscular, unless sterile syringes are used; (4) blood-sampling, whether of venous or of capillary blood.

A so-called blood-gun is extremely risky to use, being very difficult to sterilize. It ought preferably to be replaced by a needle-holder and exchangeable gramophone needles.

By the use of sodium fluorescein solution under ultra-violet light a model-experiment has been conducted and has shown that there is risk of infection transmission if non-sterile syringes

are used for venepuncture. At blood-sampling for the sedimentation test we must also calculate with the presence of this risk.

The risk of infection can be eliminated in two ways: (1) by the use of sterile needles alone without syringes at venepuncture; (2) by the provision of a sufficient number of syringes to enable a fresh sterilized instrument to be used for every patient.

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SYRINGE-TRANSMITTED JAUNDICE

AN INQUIRY AND A PLEA

BY

R. S. MORTON, L.R.C.P.&S.Ed.

Assistant Medical Officer, Newcastle General Hospital

At least two articles have been published demonstrating the inadequacy of sterilization technique coincident with a high incidence of jaundice in V.D. clinics. Three convincing series of observations (notably that of Laird, 1946) show that adequate sterilization and supervision of intravenous technique result in a fall in the percentage of syphilitics developing hepatitis while under treatment.

The present investigations were conducted in a V.D. clinic where sterilization and intravenous technique were believed to be adequate and yet the incidence of hepatitis was high. The period reviewed was April 1 to Sept. 30, 1947; only male patients receiving intravenous arsenicals were investigated. Results were as follows:

	No. of Cases	No. Previously Under Treatment	No. of New Cases
Investigated	338	173	165
Observed for 6 months	242	135	107
Deve'oping hepatitis ..	64 (26·4%)	28 (20·7%)	36 (33·6%)

"New" cases indicate those coming under intravenous arsenical therapy for the first time.

It will be appreciated that at April 1 a certain number who should have been still "under treatment" were lost to the series on account of hepatitis, with subsequent suspension of arsenicals. This could explain the discrepancy in the percentages 20.7 and 33.6.

Three of the "previously under treatment" cases of jaundice occurred in patients transferred from other clinics for continuation of treatment; all three developed jaundice within three weeks of their first attendance after transfer. This very short incubation period makes it unlikely that they received their infection at this clinic.

Only one death occurred among the 338 cases—from agranulocytosis believed due to arsenicals. The patient developed pneumonia with slight icterus and bile in the urine. This case is not included among those developing hepatitis. Patients receiving penicillin or bismuth and routine blood tests only were not included in the investigations.

Sterilization was conducted by boiling in a small electric sterilizer, which was also used for the blood-collecting and bismuth syringes. Boiling took place in a room separate from the medical officer's examination and treatment room; the process was therefore not under his easy control. About fifteen syringes of the numbered "vim" pattern were available for intravenous therapy. For boiling, the syringes were dismantled and wrapped in gauze, and it was noted that they were not always completely submerged in the boiling water. Boiling times varied between 10 and 30 minutes. On completion of boiling the wrapped syringes were laid on a tray ready for use. Needles were similarly boiled and placed in a dish of distilled water. Preparation of the injection material in a gallipot was carried out by the male orderly, using distilled water from an upturned flask. The charged syringe was handed to the medical officer, who gave the injection. The syringe was then returned to the orderly, who washed it out with tap-water and placed it in the "dirty" bowl; this bowl contained distilled water, changed daily, and it was the practice to draw a few millilitres of the water into each syringe as it was placed in the bowl. Before wrapping a syringe for boiling, the water in it was ejected into the bowl again. No antiseptics were used at any stage of the procedure.

Preparation of intravenous material and charging of syringes was carried out on a bench behind the medical officer while he was examining patients and/or reading and writing case notes. It was observed that at the end of almost every session investigated the number of syringes in the "dirty" bowl did not correspond to the total number of injections given during the session. It was noted also that this occurred irrespective of the medical officer or orderly on duty and irrespective of any combination of the same.

Specimen observations are as follows:

Day 1: Morning Session

8.30 a.m.—*Tray:* Syringes Nos. Z535, 843, 0124. *"Dirty" Bowl:* Syringes Nos. 330, 7, 140, X130, Record.

9.15 a.m.—*All* syringes were boiled for 15 minutes.

10.00 a.m.—Session started, running to 12 noon.

12.15 p.m.—*Tray:* Syringes Nos. 843, 330, 0124, X130, 140, Record. *"Dirty" Bowl:* Syringes Nos. 7, Z535.

No boiling took place during the session. Seven intravenous injections were given and only two syringes, 7 and Z535, were used.

Day 2: Morning and Afternoon Sessions

8.30 a.m.—*Tray:* Syringes Nos. 843, 567, Z535, 330, Record, X130. *"Dirty" Bowl:* Syringes Nos. 140, 7, 0124.

9.15 a.m.—Syringes Nos. 0124, 140, and 7 were boiled for 20 minutes.

10.00 a.m.—Session started, running till 12 noon.

12.15 p.m.—*Tray:* Syringes Nos. 843, 567, Z535, 330, Record, X130. *"Dirty" Bowl:* Syringes Nos. 140, 7, 0124.

No boiling took place during the session. Five intravenous injections were given and only three syringes, 140, 7, and 0124, were used.

7.15 p.m.—Despite further intravenous therapy the arrangement at 12.15 p.m. still existed. Except for the 9.15 a.m. boiling, no boiling took place during the day.

Day 3: Morning and Afternoon Sessions

8.30 a.m.—*Tray:* Syringes Nos. 843, 567, Z535, 330, Record, X130. *"Dirty" Bowl:* Syringes Nos. 140, 7, 0124.

9.15 a.m.—Syringes Nos. 140, 7, 0124 were boiled for 15 minutes. No further boiling during the day.

7.15 p.m.—*Tray:* Syringes Nos. 843, 567, 7, Z535, Record. *"Dirty" Bowl:* Syringes Nos. 140, X130, 0124, 330.

Ten intravenous injections were given during the day, and only five syringes, 140, X130, 0124, 330, and Record, were used.

It was therefore obvious that syringes were used and re-used without adequate sterilization. Such routine was contrary to standing instructions.

Seventeen male sessions were held per week—six of one and a half hours and eleven of two hours. The average number of patients examined and/or treated per session was 37.

The possibility of demonstrating case-to-case transmission was frustrated by the irregular number of syringes used per, say, any ten patients and by the erratic boiling times. It could be shown that all new patients who developed jaundice had at least three of their intravenous injections on a day when patients incubating the disease were having similar treatment. Mondays and Saturdays were the days most in question, and it was noted that these were the two busiest days.

Incubation periods for the 36 "new" cases were: under 100 days, 14 cases; between 100 and 200 days, 17 cases; over 200 days, 5 cases. It is believed that the longer incubation periods are probably due to the patient's receiving a contaminated injection late in his course of treatment, but the possibility of a contaminated blood-collecting syringe being used early in the period of surveillance cannot be excluded.

Discussion

It must appear obvious that while the clinic technique may have the appearance of orderliness and cleanliness it is, in fact, far from being surgically clean—i.e., the system is "open" to the possibility of cross-infection at several stages. Proper sterilization and control are of paramount importance in a V.D. clinic, where the syphilitic patient is "needled" by all the methods recognized as being followed by hepatitis —i.e., intravenous, intramuscular, and blood-collecting. In this clinic the sterilizing capacity would appear to be inadequate and the number of syringes insufficient to allow of proper day-to-day cleaning and sterilizing. Boiling procedure is not easily controlled The male surgery is badly laid out from the point of view of easy supervision of syringe charging and disposal. The number of patients attending per session, necessitating clinical examinations, writing of case notes, lumbar puncture, intravenous treatment, etc., is such that the medical officer has little time for supervising the details of the surgery routine. Previous observers have noted the high percentage of jaundice in large clinics and its relative absence in small clinics and in private V.D. work.

Possibilities of transference of hepatitis arise from the re-use of unsterilized syringes, the repeated use of the gallipot without sterilization, the drawing up of water from the "dirty" bowl into used syringes, and the inadequate boiling of syringes. The handling by the orderly of both dirty and clean material cannot be overlooked. Other possible sources of infection were syringes used for injecting penicillin and bismuth and for blood collecting.

An incidence of 33% of treated syphilitics developing hepatitis, with all its consequent loss of working hours, complications, and even death, is a heavy price to pay for the high-pressure organization. The full benefits of social work directed at bringing defaulters back under treatment are in jeopardy. While returning defaulters may survive the late complications of syphilis, a small proportion are liable to fall heir to the late complications of hepatitis, as pointed out by Damodaran (1948). Until, in clinics, the incidence of jaundice is taken as a measure of surgical cleanliness this preventable disease will persist.

From the foregoing it is obvious that the practical aim should be to convert the "open" system to a completely "closed" one. It is not enough to aim at thoroughly sterilized syringes only, very important though it be, but the other gaps must also be closed, so that a double check is placed on all possible sources of contamination. As Batchelor says in a personal communication, "the standard of sterilization required is that used by bacteriologists, for example, for blood culture."

The following recommendations are made:

1. For each injection of penicillin, arsenic, and bismuth, or for blood collecting, a separate syringe and needle should be used.

2. That a room be set aside in the clinic for autoclave sterilization installations. After use, all syringes and needles should be washed out thoroughly with tap-water, completely reassembled, and placed in a test-tube with loose cotton-wool plugs at the bottom and the top cap. These test-tubes should be collected in wire baskets for easy use in autoclaving. The autoclave should be in charge of a competent State-registered nurse or specially selected orderly. Hot-air sterilization could be used. Failing such a self-contained arrangement, the adjoining hospital could be encouraged to set up a central sterilization-room. Not only would the clinic's needs be supplied, but lumbar puncture trays, catheter trays, syringes, etc., could be made readily available for use through the wards of the hospital. Further, laboratory material could be supplied sterilized and ready for use.

3. That a note of the number of the syringe used be made on the patient's record card.

4. That the lay-out of the male surgery be completely recast with a view to easy supervision.

5. That the medical officer should prepare the injections himself—i.e., handle all the clean material and the orderly the "dirty" only.

6. That the gallipot be dispensed with, and distilled water supplied sterilized in 20-ml. bottles with rubber-lined screw-cap tops. By this means each injection could be prepared separately and in a sterilized container.

7. That the "dirty" bowl be discarded.

8. That additional medical staff be available for peak sessions.

Summary

An investigation was made into the continued incidence of jaundice in a V.D. clinic where sterilization was believed to be adequate.

The faults in sterilization and technique are noted, together with the reasons for them.

Recommendations are made for proper sterilization and for conditions conducive to easy supervision and a simple technique.

A plea is made for immediate and routine action based on the greater sense of responsibility arising from an understanding of the accepted data.

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The Welfare Services Bill for Northern Ireland, which has recently been published, will come into force on Jan 1, 1949, if passed by Parliament. One of the principal provisions relates to the duty of providing residential accommodation for persons who by reasons of age, infirmity, or other circumstances are in need of care and attention not otherwise available to them. It is not proposed that they all ought to be encouraged to enter a home or hostel. A clause prohibits the provision of anything in the nature of hospital accommodation or services so as to prevent any chance of overlapping with the work of the Hospitals Authority and also to preclude the possibility of "chronic wards" developing. Everyone accepting accommodation must pay for it. Those who can will pay out of their own resources, while others will rely on National Insurance or National Assistance grants. The old test of destitution now disappears with the virtual disappearance of destitution itself. In addition, the Bill proposes temporary accommodation and emergency lodging of a short-term nature for persons who find themselves suddenly without a home because of such perils as fire, flood, or eviction. This, too, must be paid for.

INTERINNOMINO-ABDOMINAL OPERATION

REPORT OF A CASE SUBSEQUENTLY FITTED WITH A PROSTHESIS

BY

DAVID MITCHELL, F.R.C.S.

AND

J. A. BAIRD, M.B., Ch.B.

(From Palmerston North Hospital, New Zealand)

In recent years there has been a considerable increase in the number of patients submitted to this formidable operative procedure. To Girard goes the credit for the first successful amputation of this type in 1895, although Bilroth had performed this operation six years previously (in 1891, according to some authors). At least 175 cases have now been reported in the literature. Until 1935 the operative mortality in 79 patients was about 60% (Gordon-Taylor and Wiles, 1935). Since the latter workers' authoritative communication the operative mortality has been reduced to less than 14%. This no doubt reflects the added facilities for blood transfusion.

In the great majority of cases this amputation has been used in patients with malignant neoplasms affecting the root of the lower limb, in which disarticulation at the hip-joint would be inadequate. The remainder have been carried out for chronic infective processes, tuberculous or osteomyelitic, in the region of the hip-joint. These diseases would seldom be indications for this formidable operation to-day. So far as can be ascertained, this is the first Australasian case to be published, but McCaw of Auckland was successful in his case (Gordon-Taylor, 1940).

Case Report

The patient, a female aged 19, was admitted to Palmerston North Hospital on Dec. 3, 1945, complaining of pain in the left hip and groin of two years' duration. During the preceding months she had lost a considerable amount of weight. Owing to the severity of the pain she was unable to walk and her sleep was much disturbed.

On examination she was thin and pale, with obvious muscular wasting. The left thigh was flexed and adducted, and pronounced muscle spasm was present. Movements in all directions were considerably limited by this and by the pain. There was no tenderness. *X*-ray examination of the left hip region and the chest revealed no lesion. A provisional diagnosis of tuberculous disease of the hip-joint was made and the appropriate treatment instituted.

The patient continued to lose weight. In March, 1946, a lump the size of a walnut was palpable in the upper part of Scarpa's triangle. Biopsy examination of this proved it to be a fibrosarcomatous tumour of indefinite origin. *X*-ray examination still showed no lesion of the hip-joint and environs. The patient's physical condition continued to deteriorate rapidly and she exhibited a considerable degree of malignant cachexia.

Towards the end of May her condition appeared to have improved. The tumour in her abductor region had grown slowly. In the left buttock there was a prominent tumour mass accentuated by the wasting of the gluteal muscles. Ignorant of her hopeless condition, she had shown an excellent mental attitude throughout.

As it was considered that this type of neoplasm is relatively insensitive to *x*-ray therapy, a hind-quarter amputation was now considered. No invasion of the pelvis was evident in an examination per vaginam under anaesthesia. There was now *x*-ray evidence of involvement by the tumour of the neck and upper part of the shaft of the left femur. No pelvic invasion or pulmonary metastases were demonstrated. The red cell count was 3,440,000 per c.mm. and haemoglobin 70%. A pint (568 ml.) of blood was transfused on June 12 and again two days later. On the day before operation the Hb was 92% and the blood pressure 110/70. Her weight was 5 st. (31.75 kg.).

Operation

On June 18 a left interinnomino-abdominal amputation was performed. Twelve ml. of a 1 in 1,500 solution of nupercaine (cinchocaine hydrochloride) was administered intrathecally. This was supplemented by light ether anaesthesia. A cannula was inserted and blood transfusion was started soon after the anterior skin incision was made. The operative technique followed closely that described by Gordon-Taylor and Wiles (1935).

During the first 40 minutes the patient received 1,000 ml. of blood, and her condition gave rise to no anxiety. At this stage, however, her pulse quickened and became weak. The systolic blood pressure fell from 90 to 60 mm. Hg, and was obtainable only by palpation. "Neosynephrin" was administered intramuscularly and the rate of the blood drip was increased. Within 10 to 15 minutes her condition steadily improved. On leaving the theatre the patient's pulse was of fair volume and the rate 120 a minute. She had received a total of 1,500 ml. of blood during the operation. The operative time was 70 minutes.

Post-operative Treatment

One hour after her return to the ward she was fully roused and her condition had greatly improved. A further transfusion of 900 ml. of blood was given by slow drip. This was followed by intravenous glucose and saline, which were continued for 72 hours post-operatively owing to the patient's poor appetite.

Catheterization was performed eight-hourly for the first three days. The two drains were shortened daily and finally removed in six days. On the seventh day the patient was given a small enema, which was followed by a good faecal result. Subsequently her bowels moved normally.

On June 26 all sutures were removed, and, except for a small area at the site of one of the drains, the wound was soundly healed. The left labium of her vulva was oedematous and remained so for several weeks. Owing to the advanced degree of cachexia which was present for some weeks before operation the patient's limb muscles were lacking considerably in tone. Physiotherapy was instituted to overcome this.

FIG. 1.—The specimen after dissection of the anterior masses.

One month later her physical condition had improved greatly. Her weight was now 4 st. 12 lb. (30.84 kg.): she had gained 14 lb. (6.35 kg.) since the operation. The tone of her abdominal musculature was good. She was now using crutches.

The patient continued to gain weight after her discharge from hospital, and 15 months from the date of her operation she weighed 7 st. (44.45 kg.) without clothes or prosthesis. *X*-ray examination of her pelvis and chest revealed no evidence of recurrence or metastases. There has been no complaint of a phantom limb.

Pathology

Dissection of the tumour following removal revealed two large masses and a small one occupying the whole of Scarpa's triangle (Fig. 1). A fourth large mass was present in the gluteal region.

Pathological Report (Dr. T. H. Pullar).—"On cutting up the specimen widespread invasion of the muscles around the hip-joint is found. . . . The growth seems to invade the capsule of the hip-joint and the periosteum in this region. It has involved the obturator membrane, but has not completely traversed the fibres of the obturator internus muscle, so that no growth can be seen on the pelvic aspect of the innominate bone. . . . The neck and head of the femur are composed of bone which is much

easier to cut than normal cancellous bone, though no macroscopic invasion of bone by the tumour can be seen. Sections from the head of the femur show no neoplastic invasion. Sections from the main masses of growth show the same structure as in the former biopsy—a spindle-celled fibrosarcoma of slow-growing type. I think now that this fibrosarcoma is of periosteal origin. . . . Apparently the growth has been completely removed."

The Prosthesis

Several authors express the opinion that no satisfactory prosthesis has been devised for these amputations (Sugarbaker and Ackerman, 1945; Hill and Todd, 1946; Pack *et al.*, 1947). No case has been recorded in which a prosthesis has been fitted,

FIG. 2.—*X* ray showing the site of section of the ilium.

although Gordon-Taylor and Patey (1946) mention that Harris and Laird's patient is walking on a tilting-table prosthesis. It has been suggested that as much of the ilium as possible should be saved to serve as a supporting shelf. In the case here recorded there remained only a small portion of ilium (Fig. 2), which was well covered with muscle. Six months after operation arrangements were made with Mr. J. K. Elliott, visiting orthopaedic surgeon to the Wellington and Palmerston North Hospitals, to have a prosthesis (Figs. 3 and 4) constructed at the Disabled Servicemen's Rehabilitation Centre, Wellington. In May, 1947, the patient had full control of her prosthesis, and was walking well with the aid of a stick, with only a slight limp. The tilt of her pelvis towards the side of the amputation was scarcely noticeable.

FIG. 3.—Photograph of the patient with her prosthesis 15 months after operation.

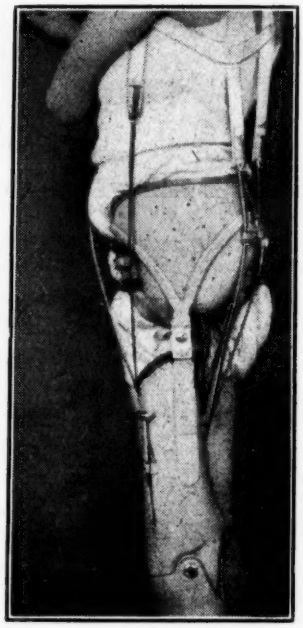

FIG. 4.—Photograph of the lateral aspect of the prosthesis.

At the time of writing this patient is very well, with no *x*-ray signs of metastases, and is enjoying an active and useful business career.

Discussion

The poor physique of this patient, largely the result of malignant cachexia, doubtless rendered the operative procedure less difficult technically than one is led to expect from the various accounts. This same factor, however, added considerably to the operative risk. In an operation of this magnitude the prevention of surgical shock is of profound importance. Preventive measures undertaken were as follows: (1) Gentle but deliberate handling of all tissues. (2) The replacement of the blood loss by adequate transfusion. The loss of plasma is associated with surgical shock, which inevitably occurs to some extent. Whole blood loss was reduced to a minimum by careful haemostasis. Morton (1942) suggests elevation of the limb following ligation of the external iliac artery to drain the contained blood. (3) Spinal analgesia and infiltration of the large nerves with procaine hydrochloride before section to prevent the passage of harmful impulses from traumatized tissues.

Gordon-Taylor and Wiles (1935) emphasize the importance of these measures, but Morton (1942) and other surgeons, both British and American, have used general anaesthesia alone with good results. Sugarbaker and Ackerman (1945) employed continuous spinal analgesia with thiopentone.

Ample assistance is of the utmost importance in a case of this kind. The surgeon in the present case acknowledges gratefully the skilled assistance of Mr. J. H. North as well as that of Dr. C. K. Swallow and Dr. J. A. Baird, who had charge of the transfusion arrangements during and after the operation. We are also indebted to the medical superintendent of the Palmerston North Hospital for permission to publish this report.

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In accordance with the Transfer of Functions (Food and Drugs) Order, 1948, the Ministry of Food is now the central department concerned with the composition, description, and inspection of food, and with hygiene conditions in the food trades. The Ministry of Food's responsibilities under the new arrangements will be discharged by three divisions: The Food Standards and Labelling Division (under Mr. C. A. Adams) is responsible for the promotion of food standards, and exercises the central department's functions in relation to those sections of the Food and Drugs Act dealing with the composition and description of food, the Defence (Sale of Food) Regulations, and the Labelling of Food Order. It handles all technical correspondence with chemists. The Food Hygiene Division (under Mr. N. R. C. Dockeray) is responsible for the promotion of measures to improve hygienic conditions in the food trades and exercises the central department's functions in relation to those sections of the Food and Drugs Act dealing with food inspection and hygiene. The Liaison Division (Food Standards and Food Hygiene) (under Mr. R. Wentworth) provides for these two Divisions a liaison with the local authorities and with the public (other than manufacturers and traders). It deals with all inquiries from local authorities about the day-to-day administration of this legislation, including applications for the Minister's consent to prosecutions, public analysts' appointments and reports, and applications under Sections 15 and 16 of the Food and Drugs Act, 1938. It is also responsible for liaison with the local authority associations and professional bodies. The address of all three divisions is 47, Portman Square, London, W.1 (Telephone: Welbeck 5500).

SPONTANEOUS RUPTURE OF MUSCLE AS A COMPLICATION OF RHEUMATOID ARTHRITIS

BY

G. D. KERSLEY, M.D., F.R.C.P.

Physician in charge Chronic Rheumatism, Bristol Royal Hospital, Physician to the Royal National Hospital for Rheumatic Diseases, Royal United and Orthopaedic Hospitals, Bath, and Arthur Stanley Institute of the Middlesex Hospital, London

Sudden major ruptures of muscle fibres, unassociated with trauma, do not appear among the listed complications of rheumatoid arthritis. As two cases illustrating the condition have been seen within a month of each other, it seemed advisable to put them on record. Rupture of muscle fibres unassociated with any sudden strain or unaccustomed exercise is stated to occur secondary to haemorrhages due to the blood diseases and also in the abdominal muscles in pregnancy. In the cases described below they seem to have been entirely secondary to the rheumatoid changes taking place in the muscle.

Case 1

A medical practitioner aged 56 had had bronchiectasis after being gassed in 1918. Eighteen months before the muscle rupture he had developed a typical polyarthritis, beginning in the right wrist and spreading to the shoulders, knees, hands, ankles, and feet, and he had lost over 2 st. (12.7 kg.) in weight. The bronchiectasis had been treated by all the usual methods, including penicillin by injection and inhalation, and for the arthritis he had been on a rest-and-diet regime, and had been given gold, blood transfusions, *x*-ray therapy for the knees, and many physical treatments. The sedimentation rate was very rapid (50% in the hour), the haemoglobin value was 60%, the colour index was 0.7, and the white count was normal but with a marked Arneth shift to the left. While walking across the room at a nursing-home he felt a sudden pain in the right calf muscle, and on examination during contraction a swelling was observed with a gap below it. Bruising became apparent shortly afterwards. Within two weeks the condition became painless and a good functional result was obtained, though obvious anatomical deformity on muscular contraction persisted.

Case 2

A man aged 54 had developed typical rheumatoid arthritis without any known antecedent cause. Two years ago—that is, four years after the onset of the trouble—he suddenly felt a slight pain in his left thigh and noticed a swelling, which has persisted ever since but has caused no disability. Four months ago, again without any trauma, a slight pain, like an electric shock running up the forearm, drew attention to the sudden fracture of the extensor tendon of the fourth digit of the right hand. About the same time inability to flex the terminal joint of the third digit of the left hand was noticed, and was found to be due to a rupture of one of the tendons of the flexor digitorum profundus.

FIG. 1.—Depression in the quadriceps muscle due to spontaneous rupture.

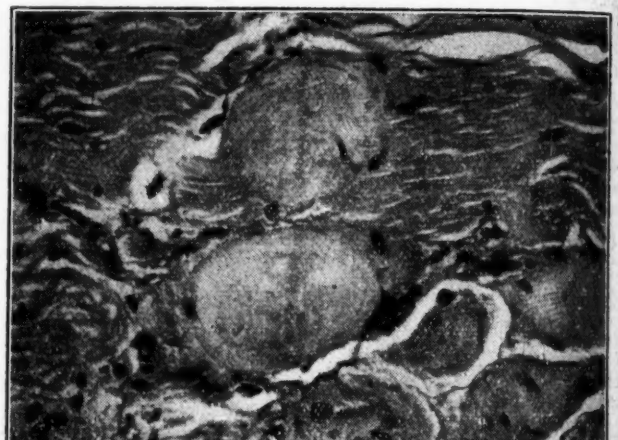
Bruises have also appeared periodically on various parts of the body without his knowledge of any definite injury. In the earlier years of the arthritis he had had considerable pain on rest as well as on movement, but latterly on movement only. He had at no time lost much weight.

On examination he was seen to be a well-covered man weighing 15 st. (95.25 kg.). Most of his joints showed some involvement. His hands presented the typical rheumatoid deformity, with ganglia at the wrist, and there were also typical rheumatoid nodules on the left elbow, in the left bicipital region, and on both Achilles tendons. A slight swelling giving a soft crepitus on palpation was discovered anterior to the right shoulder-joint. A swelling with a depression below it was observed in the left quadriceps muscle (Fig. 1), and also a bruise (of recent date) on the left thigh. There was a drop-finger due to a break in the extensor tendon of the right fourth digit (Fig. 2), with inability to flex the terminal joint of the right third digit voluntarily, but no stiffening of this joint.

FIG. 2.—Hand showing "rheumatoid ganglion" and drop-finger of fourth digit.

The sedimentation rate was moderately raised (32 mm. Wintrobe); the haemoglobin was 87%, and the colour index 0.8. The platelets and the bleeding and clotting times were normal. The plasma uric acid was 5.3 mg. per 100 ml. (a high normal).

A biopsy performed at the site of the quadriceps muscle rupture showed very marked degenerative changes in the muscle fibres, with complete disappearance of striation, together with large areas of fibrous tissue but little inflammatory reaction (Figs. 3 and 4). A nodule removed for examination proved to be typical of those usually found in rheumatoid arthritis.



FIGS. 3 and 4.—High- and low-power photographs of biopsy section at the site of spontaneous rupture, showing very marked degeneration of some of the muscle fibres with loss of striation and slight cellular reaction between the muscle fibres. No typical rheumatoid "foci" were seen in this biopsy specimen.

Medical Memoranda

A Case of Barbiturate Poisoning Treated with Picrotoxin and Colonic Lavage

Barbiturate poisoning is fairly common at the present time, yet there are few references to treatment of cases in this country. There is a fairly full American literature on the subject, but even there phenobarbitone, a frequently prescribed drug, is rarely incriminated. Phenobarbitone is one of the longest-acting of the barbiturates and, being slowly absorbed and excreted, is cumulative. Whitla (1943) says that not more than 3% is excreted after 24 hours, and after six days only 15%. We could find no authority on its rate of absorption.

The place of picrotoxin in the treatment of barbiturate poisoning is now generally accepted, but in this country the large doses necessary are not always realized. Lovibond and Steel (1939) used 60 mg. over a period of 12 hours, with recovery of consciousness, and they emphasized the risk of relapse into unconsciousness if picrotoxin is discontinued too soon; this relapse into coma observed by other writers is confirmed here. Irving (1943) gave 992 mg. of picrotoxin to a patient, who died of pneumonia after five days. In America very large doses of picrotoxin have been given in barbiturate poisoning. The largest recorded is 2,134 mg. by Rovenstine (1938).

In a perusal of easily available literature we found no mention of the vital necessity for colonic lavage. In the case described below no less than 50% of the ingested drug was recovered undissolved by early colonic lavage. It is obvious that in this instance colonic lavage was much more than a ceremony.

Case History

A woman aged 27 was admitted at 4 p.m. on July 13, 1947, as a possible case of poisoning. She was an old case of psoriasis, and phenobarbitone had been prescribed at intervals over the past 18 months. She had been heavily asleep that morning, but nothing unusual was suspected until 1 p.m.

On examination she was comatose and flaccid, and, except for a flexor plantar response, all reflexes, including the corneal, were absent. She did not respond to painful stimuli. The pulse was 70 a minute and of good volume; temperature and respirations were normal. Routine tests showed no abnormality in the urine. Stomach wash-out resulted in bile-stained fluid, and lumbar puncture was normal. Despite the lack of positive evidence, a diagnosis of barbiturate poisoning was made, and picrotoxin, 10 mg. two-hourly, was given intramuscularly, no veins being available.

Next day the patient was comatose but restless; the limbs were flaccid and the corneal reflex sluggish. At noon a colonic wash-out produced 40 to 50 small white tablets in the faeces, partly dissolved. They proved to be 1-gr. (65-mg.) tablets of phenobarbitone. Picrotoxin was stopped at 11.30 p.m., 130 mg. having been given. The evening temperature was 99.5° F. (37.5° C.). A further colonic wash-out was returned with no faeces or tablets. On July 15 she was still unconscious, but moved on painful stimulation. Picrotoxin, 48 mg., was given between 1.15 and 9 p.m. with no apparent effect. The evening temperature was 100° F. (37.8° C.). She was incontinent.

The following morning the patient was conscious and recognized her father, but later became unconscious again. At 11.15 p.m. she was deeply unconscious and could not be roused. Picrotoxin, 16 mg., was given intravenously with some increase of activity. A stomach wash-out and an enema were given; faeces were found, but no further tablets. The temperature rose to 100.4° F. (38° C.) in the evening, having been 98°–99° F. (36.7°–37.2° C.) all day.

Starting at 1 a.m. on July 17 ten-hourly doses of 10 mg. of picrotoxin were given. At 11 a.m. she was conscious and rational, but drowsy. The temperature was normal. Picrotoxin was discontinued at 8.30 p.m. She was kept awake, and frequent cups of strong coffee were given. On July 18 she was fully conscious, but uncooperative and depressed. Next day she was quite normal. The patient later admitted to taking 80 gr. (5.28 g.) of phenobarbitone.

Comment

The points we wish to emphasize are: (1) The patient received a fairly large dosage of picrotoxin (264 mg.) over five days without producing convulsions, 16 mg. being given intravenously on one occasion. (2) The necessity for continuing picrotoxin therapy to avoid relapse. (3) Of the 80 gr. of phenobarbitone taken probably some 40 gr. (2.64 g.) was absorbed, the remainder being recovered undissolved in the faeces, thus demonstrating the importance of colonic lavage.

Acknowledgment is due to Dr. Browning Alexander for permission to publish this case, and to Mr. T. H. Benians, pathologist to Prince of Wales's General Hospital, for identifying the drug recovered.

R. W. BAZELEY, M.B., B.S.,
Senior House-Physician.
P. H. GARRARD, M.B., B.S.,
Junior House-Physician.
Prince of Wales's General Hospital, N.15.

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A Case of Delayed Dicoumarol Intoxication

In view of the widespread use of dicoumarol by physicians and surgeons at the present time the following case report may be of interest.

Case History

The patient, a married woman aged 37, who was known to have bilateral basal bronchiectasis, was admitted to hospital on Dec. 11, 1947, under the care of Mr. J. T. Chesterman. On Jan. 1, 1948, she developed an area of thrombophlebitis in her left calf, and further venous thromboses appeared on subsequent days in both legs and both arms. A tentative diagnosis of thrombophlebitis migrans was made and the patient was given dicoumarol, starting with 300 mg. on Jan. 14 and continuing with a further 300 mg. daily until Jan. 21 (total dosage, 2,400 mg.). The patient's prothrombin index was estimated by Quick's method on Jan. 17, 19, and 21, when the values compared with a normal control were 175%, 112%, and 72% respectively.

On Jan. 21 the patient was transferred to a medical ward under the care of Professor C. H. Stuart-Harris. At that time she gave evidence of bilateral basal bronchiectasis, with areas of consolidation at both bases. Her temperature was 102° F. (38.9° C.) and blood pressure 115/70 mm. Hg. There was a small area of thrombosis in her right calf.

No dicoumarol or other drug was administered after the patient's transfer, and from Jan. 21 to Jan. 29 her condition remained unchanged. On the latter date she had a small epistaxis on two occasions and complained of vague abdominal pain, for which no cause could be found.

On Jan. 30 she began to cough up considerable amounts of bright-red blood unmixed with sputum; she twice vomited "coffee-ground" material and started the first menstrual period for over six months; there was frank haematuria, confirmed by catheterization; and the skin and mucous membranes showed widespread purpura. She became obviously anaemic (Hb 54%, red cells 3.2 millions) and her blood pressure fell to 90/60 mm. Hg. The bleeding time was ¼ minute, the clotting time 15 minutes, and the prothrombin index 42%. She was transfused with one pint (568 ml.) of stored blood and given vitamin K parenterally.

On Jan. 31 the patient passed a melaena stool. A small amount of blood was present in the sputum, and there was slight bleeding from the bladder and uterus, but there were no further skin haemorrhages. B.P. 110/65; Hb 46%. On Feb. 2 the sputum was tinged with blood, but there was no other bleeding. Hb 36%; red cells 2.5 millions; prothrombin index 117%.

By Feb. 4 the sputum was no longer blood-stained. The patient was given a further transfusion of 2 pints (1.14 litres) of whole blood. She continued to make good progress, and by Feb. 18 her blood count had risen to a satisfactory level (Hb 80%; red cells 5.7 millions). No further bleeding occurred during the patient's subsequent stay in hospital.

Comment

Thorensen (*Lancet*, 1947, **43**, 421) reported severe haemorrhage occurring as long as 3½ months after the administration of large doses of dicoumarol. The interesting feature in this case is the small total dosage used and the failure of the prothrombin index to reach the recommended therapeutic level at any time. The response to stored whole blood was dramatic.

I have to thank Dr. J. Clark, medical superintendent of the City General Hospital, Sheffield, Mr. J. T. Chesterman, and Professor C. H. Stuart-Harris for permission to publish this case.

C. E. DAVIES, M.R.C.P.,
Department of Medicine, the University, Sheffield.

Reviews

BELGIAN TROPICAL MEDICINE

Liber Jubilaris J. Rodhain. A l'Occasion de son Soixante-Dixième Anniversaire. Société Belge de Médecine Tropicale. December, 1947. (Pp. 412. No price given.) Brussels: Ad. Goemaere, 21, rue de la Limite. 1947.

The *Festschrift* or *liber jubilaris* has become increasingly popular, for it provides a graceful and permanent means of paying tribute to those who by their age and academic achievements have deserved well of their colleagues and fellow workers; its disadvantage is that owing to its frequently limited circulation the important papers which it contains are only too easily lost or overlooked. This example of the *Festschrift* honours Professor Jerome Rodhain on the occasion of his seventieth birthday. Professor Rodhain, who, hale and hearty, is still publishing papers on his chosen specialty, is the doyen of tropical medicine in Belgium, and to him is largely due the inauguration of medical research in the Belgian Congo. The volume which has been presented to him contains 29 contributions by colleagues in Belgium, France, Rumania, England, North and South America, and Indonesia, written in French, Flemish, Dutch, and English.

In the first paper A. Dubois and A. Duren give a full account of the history of all aspects of medicine in the Belgian Congo, including Foreami. This communication is of great interest, for all who know tropical Africa have been struck by the high efficiency of medical care in the Congo. C. C. Chesterman describes the assistance rendered by Protestant missions to the health services of the Congo. The other main contributions are on trypanosomiasis, amoebiasis, and malaria. D. L. Augustine writes on *T. lewisi* in the rat and shows that reproduction occurs primarily in the blood stream. C. A. Hoare considers the behaviour of tsetse-borne trypanosomiasis outside its natural boundaries in Mauritius, the West Indies, and South America, as well as in Africa. *Trypanosoma vivax* especially can be readily transmitted by mechanical vectors. L. van Hoof, C. Henrard, and E. Peel report natural infections due to *T. brucei* in an area infested with *Glossina palpalis* where *G. morsitans* is absent, and M. Vaucel and J. Ceccaldi discuss whether reinfection is possible in those who have once been infected or whether the reappearance of trypanosomes in the blood is a relapse after a long latent period. Considering amoebiasis H. Anderson and E. L. Hansen describe a number of different media for the cultivation of *Entamoeba histolytica*; Clifford Dobell shows that a biphasic medium containing a solid and a liquid phase is unsuitable for testing the amoebicidal action of drugs *in vitro*, and Sir Philip Manson-Bahr discusses secondary bacterial infections of amoebic abscess of the liver. C. W. Rees and L. V. Reardon consider the growth requirements of parasitic protozoa in the light of what is known of their metabolism.

Malaria receives attention. M. F. Boyd shows the long persistence of infections due to *P. malariae*. Professor Ciuca and his colleagues describe degenerate sporozoites in *Anopheles maculipennis* var. *atroparvus* experimentally infected with *Plasmodium vivax* and *P. falciparum*, and F. Hawking and R. Hunt describe the *kochi* type of malaria parasite found in monkeys. E. Brumpt attempts to clarify the role of filariasis in the causation of elephantiasis; R. Deschiens and L. L. Lamy review very fully the chemotherapy of oxyuriasis; H. C. de Souza-Araujo records his experience with promin in leprosy. Faust gives an account of plague in the Americas and E. Grasset tells of the venom and antivenin of *Bitis nasicornis*. Other subjects discussed are the control of *Pediculus capitis* (P. H. van Thiel); the isolation and tissue culture of the virus of chicken erythroblastosis (L. van den Berghe); the "modalities" of infection (Edmond Sergent); Congo red fever and its relation to epidemic typhus; the significance of granular forms of treponemata (A. Bessemans, P. Wittebolle, and Mlle. Baert); the therapy of pigeon trichomoniasis (L. de Blieck and H. J. W. Keidel); and the importance of Friedländer's bacillus in Indonesia (C. D. de Langen).

G. M. FINDLAY.

ISOTOPES IN MEDICINE

Symposium on the Use of Isotopes in Biology and Medicine. By 19 Contributors. (Pp. 445; illustrated. $5.00.) Madison: University of Wisconsin Press, 811 State Street. 1948.

Because of its wide scope and the authority of its contributors the symposium reported in this volume is of outstanding interest. In September, 1947, leading research workers on the biological application of radioactive and stable isotopes gave some twenty communications at the University of Wisconsin which describe the main branches of biological research with these materials and afford an authoritative and valuable survey of this important field of investigation. The list of contributors opens with the names of Hans Clarke, Urey, Seaborg, Aebersold, Nier, and continues in the same impressive fashion. Rather more than half of the articles represent surveys of work with the isotopes of particular elements or groups of elements, and their authors discuss such subjects as protein, carbohydrate, and lipoid metabolism, disturbance of calcification, and the metabolism of the thyroid. A few reports are of the work of individual laboratories on particular subjects. The bibliographies are in general wide but well selected; they are a most useful and timely survey, and include about 400 references on radioactive and 200 on stable tracer work. The various contributions are well integrated without overlap of subjects, although in the case of thyroid metabolism different parts of this field have been discussed in different sections, and the work on man and that on lower animals are discussed separately. General comment on tracer methods, their limitations and fallacies and their strength, is well presented, while the actual technique of investigation with radioactive and stable tracers is amply considered.

There are two sections on therapy with radioactive isotopes. In one, Hertz reviews the radio-iodine treatment of thyrotoxicosis and cases of thyroid carcinoma amenable to such therapy. This article has a good bibliography and forms a useful review of the course and control of therapy. In the second section Byron Hall describes the Mayo Clinic's ample experience with the radiophosphorus treatment of the leukaemias and allied conditions, the results in polycythaemia vera being particularly well described. Hamilton, in the course of a survey of the medical applications of tracers, discusses the potential value of colloidal suspensions of radioactive isotopes in therapy and describes the clinical applications of radiosodium and radiophosphorus. This book should be particularly useful to two groups of medical men: those who are entering this new field of work, or seeking to learn its scope, applications, and achievements, will read a well-balanced account of the subject, of the principles on which it depends, and of the practical hazards of work with radioactive isotopes; while those already engaged in tracer work will find it an authoritative survey of different aspects of the field and an informative source of references.

E. E. POCHIN.

FOR NURSES AND STUDENTS

Modern Surgery for Nurses. Edited by F. Wilson Harlow, M.B., B.S., F.R.C.S. With foreword by Sir Lancelot E. Barrington-Ward, K.C.V.O., M.B., Ch.M., F.R.C.S.Eng. and Ed. (Pp. 795; 429 figures. 25s.) London: William Heinemann Medical Books. 1948.

The avowed object of this book is to present to the nursing profession a complete survey of modern surgery and surgical procedure. This is a worthy ambition difficult of achievement, but the editor and his eight collaborators have made a brave and on the whole successful attempt to reach their ideal. The book may be used as a textbook and for reference. The authors discuss the special branches as well as general surgery. They present the subjects clearly, and the type, paper, and production are attractive. There are over 400 illustrations, of which most are good, though a few photographs do not sufficiently emphasize the important point. As is almost unavoidable in a book with many sections, there is occasional overlapping—e.g., there are two accounts of acute osteomyelitis; but on the whole the balance is good.

The information is well up to date. Penicillin is given its proper place, there is an excellent account of the sulphonamides, there is a description of curare, and throughout the work

general principles are insisted on. We have seldom seen it stated that a "high enema" does not depend on the height to which the tube is passed into the rectum but on the height of the douche-can, but the reader will find it put clearly here. We can recommend the book to nurses, sisters, and even to medical students beginning their clinical course.

V. ZACHARY COPE.

NORFOLK AND NORWICH HOSPITAL

A History of the Norfolk and Norwich Hospital from 1900 to the end of 1946. By Arthur J. Cleveland, O.B.E., M.D., F.R.C.P. (Pp. 179; illustrated. 15s.) Norwich: Jarrold & Sons, Ltd. 1948.

The Norfolk and Norwich Hospital, first conceived in a letter to the *Norwich Gazette* in the year 1744, was eventually founded in 1770 on the initiative of William Fellowes and Benjamin Gooch. It was built and opened in the following year, but owing to the cost having exceeded the estimate only about half of the proposed 120 beds were made available for patients. The history of the hospital was written by Sir Peter Eade in 1900 (it is now scarce). Dr. A. J. Cleveland, who has taken up this story and continued it to the end of the voluntary era, has done ample justice to his subject. The Norfolk and Norwich Hospital has always enjoyed an enviable reputation as a first-class hospital; this is no matter for wonder, for from the earliest days the governors have shown foresight and enthusiasm. Was it not at Norwich that the committee-men of old ordered two sheds for carriages, the best of spermaceti oil for their lamps, a "nest of drawers to deposit the stones extracted . . . in order to show to strangers," and a blue livery coat and waistcoat, a pair of leathern breeches, and a great hat with a yellow button and loop for the ornamentation of their porter? This high level of dignity and style has been maintained through the years, while the nest of drawers has now grown into a museum the like of which is not known in this country outside teaching hospitals.

"A society," says the author, "in which charity is superfluous may be an ideal one, but a society which does not practise charity will be the poorer for the lack of a great spiritual stimulus." At Norwich the promoters of hospital finance seem to have managed their affairs well and have at all times successfully blended the old and the new. Their contributory scheme dates from 1919, while they appear to have had an almoner as long ago as 1907. In company with other voluntary hospitals they have had to resort to charitable bazaars and other forms of minor banditry in order to maintain solvency. It is interesting to note that in 1919 the then Bishop of Norwich objected on principle to a lottery not the least attractive prize of which, to modern palates, was a joint of pork. The medical staff seem to have shown reluctance in accepting payment for patients sent by the education authorities, and in 1913 they turned down the suggestion of admitting paying patients (originally mooted in the year 1907) on the grounds that many of those who would occupy the beds did already contribute to the hospital, so that if a scale were to be fixed it might alienate other subscribers. The principle, however, was revived by Sir Rider Haggard in 1923 and finally accepted by the doctors in 1926. This reluctance on the part of the doctors is the more interesting when we look back and note in Eade's *History* that in 1774 it was decided to charge for maintenance *and surgical assistance* a patient "above the need of charitable help."

Although the committee of management in the year 1945 reached the high membership level of 65, the author records that widening of the membership was always conceded with reluctance by the board, who looked upon themselves as trustees of charitable funds and not as delegates of sectional interest. In the year 1904 a resolution carried by 9 to 2 declared it to be undesirable for ladies to serve on the board, a discussion which was challenged so vigorously by Dean Lefroy that he persuaded a special meeting of the board to reverse it by 30 to 24.

This book, which is well produced and illustrated, contains an important account of the hospital's war record and a chapter on the curious affair of the skull and coffin plate of Sir Thomas Browne.

W. H. MCMENEMEY.

BOOKS RECEIVED

[Review is not precluded by notice here of books recently received]

Medicine in the Postwar World. No. 12 of the New York Academy of Medicine Lectures to the Laity. (Pp. 109. 11s. 6d.) London: Geoffrey Cumberlege. 1948.

Includes lectures on the atom in medicine, psychiatry in wartime, and children deprived of mother love.

A Treatise on Hygiene and Public Health. By B. N. Ghosh, M.B.E., F.R.F.P.&S., F.R.S.Ed. 12th ed. (Pp. 764. 22s. 6d.) Calcutta: Scientific Publishing. 1948.

A textbook particularly intended for those who work in the Tropics.

Barbarism and Sexual Freedom. By A. Comfort, M.A., M.B., D.C.H. (Pp. 68. 3s. 6d.) London: Freedom Press. 1948.

Lectures on the sociology of sex from the anarchist point of view.

An Introduction to Medical Mycology. By G. M. Lewis, M.D., and M. E. Hopper, M.S. 3rd ed. (Pp. 336. 47s.) London: H. K. Lewis. 1948.

This edition includes an account of much new work on the laboratory investigation of the mycoses.

Occupational Therapy Source Book. Edited by S. Licht, M.D. (Pp. 90. 5s. 6d.) London: Baillière, Tindall, and Cox. 1948.

Essays by various authors on the history of occupational therapy.

Surgical Extrapleural Pneumothorax. By D. G. Alarcon, M.D. (Pp. 298. No price.) Mexico: Imprenta Universitaria. 1948.

A detailed account of the operation and of the anaesthesia required. In English.

Traité de Médecine. Edited by A. Lemierre and others. Vol. 13. (Pp. 1,119. 2,600 francs.) Paris: Masson. 1948.

This volume is on disorders of the endocrine glands.

Conquer Fear. By J. Langdon-Davies. (Pp. 173. 5s.) London: Feature Books. 1948.

Intended to help the layman to overcome anxiety and unhappiness.

The Basis of Chemotherapy. By T. S. Work, B.Sc., Ph.D., and E. Work, B.A., Ph.D. (Pp. 435. 26s.) London: Oliver and Boyd. 1948.

A review for young research workers of the chemistry, biochemistry, and pharmacology of chemotherapeutic drugs.

Diseases of the Ear, Nose and Throat. By D. G. Carruthers, M.B., Ch.M., F.R.A.C.S. 2nd ed. (Pp. 344. 25s.) London: Simpkin Marshall. 1948.

This edition includes new material on the sulphonamides and antibiotics, tonsillectomy, and local analgesia for operations on the tonsils.

El Sistema Neurovegetativo. By Plutarco Naranjo V. (Pp. 151. No price.) Quito: Imp. de la Universidad. 1948.

A short account of the development, anatomy, and physiology of the autonomic nervous system.

Technik der Kinderärztlichen Differential-Diagnostik. By A. Solé. (Pp. 384. 20 Swiss francs.) Basle: Benno Schwabe. 1948.

A practical analysis of signs and symptoms in arriving at a diagnosis.

The Practice of Endocrinology. Edited by R. Greene, M.A., D.M., M.R.C.P. (Pp. 366. 52s. 6d.) London: Eyre and Spottiswoode. 1948.

A practical account by various authorities intended for general practitioners.

Notes on Soldering. By W. R. Lewis, B.Sc. (Pp. 88. Free of charge.) Greenford: Tin Research Institute. 1948.

The author discusses difficulties that may occur in the practice of soldering.

Die Tuberkulose-Bekämpfung. By R. Griesbach. 2nd ed. (Pp. 460. M. 27.) Stuttgart: Georg Thieme. 1948.

An account of public-health measures for the control of tuberculosis.

Direct Electrocardiography of the Human Heart. By F. M. Groedel, M.D., and P. R. Borchardt, M.D., F.C.C.P. (Pp. 224. $9.) New York: Brooklyn Medical Press. 1948.

A study of the electrocardiographic findings during pneumolysis.

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PENICILLIN DOSAGE SCHEDULES

The profession in this country has been encouraged to believe that two large doses of penicillin daily are as good as six or eight small ones. It has readily accepted this doctrine, since only on this assumption is systemic treatment possible in ordinary practice or in the out-patient practice of hospitals. Yet this system is contrary to a principle which has until recently been generally accepted—namely, that the object of treatment should be to maintain a therapeutic concentration in the blood continuously. No practicable dose administered in the ordinary way will produce this for 12 hours; the doses usually given at this interval are effective for less than six. When this is acknowledged the very high levels attained for a time after each injection are sometimes said to compensate for the later and longer period during which they fall below the minimum necessary for therapeutic effect. It is clearly of the first importance to know whether this system of administration is efficient. There are two ways of deciding this, experimental and clinical. The bulk of the evidence obtained from experiments concerned with the treatment of infections in mice appears to confirm the efficacy of infrequent administration. Zubrod,[1] treating haemolytic streptococcus infection, concluded that nothing is gained by giving penicillin more often than once in 24 hours; White and his colleagues[2] treated the same infection with penicillin X and also concluded that a given daily dose has the same effect whether administered in one, two, four, or eight injections; Gibson[3] treated pneumococcal infection and found that mortality was reduced to the same extent by two as by eight injections a day, the total dose in each case being the same.

On the clinical side Jawetz[4] treated acute streptococcal throat infections in a hospital for seamen in San Francisco and found a satisfactory therapeutic effect could be obtained by giving penicillin at intervals up to 12 hours, but not longer—the necessary 12-hourly dose being 150,000 units, whereas at a 3-hour interval 10,000 units sufficed. This infection, owing to its relatively benign and self-limited character, is not an ideal subject for such a study: it could be made to serve only by precise observations on the duration of fever in different groups, and these are lacking. Unfortunately also only 81 patients were available for testing 11 dosage schedules, with the result that several schedules were tested on only four patients each, an obviously inadequate number. It is perhaps surprising that further clinical evidence bearing on this important question has not yet been published. A minor piece of evidence possibly favouring infrequent doses is a study by Parker and Luse[5] on the effect of exposing staphylococci in the logarithmic phase of growth to penicillin for only 15 minutes: on placing them in a fresh medium there was a delay before growth was resumed, though the length of this unfortunately varied inversely with the resistance of the strain.

Against this considerable bulk of evidence favouring infrequent administration must be set the findings of Eagle, who is the leading advocate of the opposite opinion and who supports it by experiment and by argument which is frankly more impressive than that of his opponents. He assembles for the first time complete tabular data about the minimum and optimum concentrations of penicillin for bactericidal effect on different species and the time required to kill a certain proportion of the bacteria, as well as the duration of different blood concentrations after various doses.[6] He puts forward the important principle that the frequency of administration should depend on the generation time of the micro-organism: that of *T. pallidum* is 30 hours, and his experiments have shown that 12-hourly doses produce an optimum effect in rabbit syphilis. On the other hand, the generation time of a pneumococcus is 30 to 40 minutes, and Eagle has found, contrary to Gibson's observations, that 3-hourly doses are much more effective than 9-hourly in treating this infection in mice. The reason for this discrepancy is not clear, and until it is forthcoming deductions based on such experiments in mice can be accepted only with reserve.

A further consideration is the bearing of the "zone phenomenon" on therapeutics; this is elaborated by Eagle and Musselman[7] in another paper. It is not by any means generally recognized that maximum bactericidal effect is achieved by quite low concentrations of penicillin (for *Staph. aureus* about 0.1 unit per ml.) and that no increase beyond this, even of many thousandfold, will accelerate it. There is therefore no advantage, as regards the direct action on the micro-organism, in achieving concentrations any higher than this. There may on the contrary be a positive disadvantage, because in the case of some bacteria increase in concentration actually reduces the bactericidal effect. These include some strains of *Staph. aureus, Str. pyogenes* of Groups B and C, and various other streptococci. Thus in treating staphylococcal infections in particular the theoretical ideal is to maintain a certain optimum concentration in the blood and tissues—for a normally sensitive strain about 0.1 unit per ml. The effects of intermittent injections, especially at very long intervals, are unsatisfactory not only in the later part of the interval, because the concentration falls too low, but also in the initial period, because it is then much too high. It is noteworthy that none of the evidence, either experimental or clinical, adduced in favour of 12-hourly dosage has reference to a "zone-sensitive" infection; it is concerned only with infection by pneumococci or haemolytic streptococci of Group A, neither of which show the zone phenomenon.

If the maintenance of a steady, moderate blood level is to be the aim of treatment the best way of achieving this is evidently by the use of procaine penicillin, the first

1 *Bull. Johns Hopk. Hosp.*, 1947, **81**, 400.
2 *Proc. Soc. exp. Biol., N.Y.*, 1948, **67**, 199.
3 Ibid., 1948, **67**, 278.
4 *Arch. intern. Med.*, 1948, **81**, 203.
5 *J. Bact.*, 1948, **56**, 75.
6 *Ann. intern. Med.*, 1948, **28**, 260.
7 *J. exp. Med.*, 1948, **88**, 99.
8 *J. Amer. med. Ass.*, 1948, **137**, 1517.

English study of which is reported in this issue by Mr. P. F. Jones and Dr. R. A. Shooter (p. 933). This relatively insoluble compound is absorbed in so leisurely a fashion that the "peak" (hardly deserving of the name) of a very flattened curve is not attained until the fourth hour, and the blood concentration falls thereafter so slowly that a 300,000-unit dose gives a therapeutic effect extending beyond 24 hours in the great majority of patients. These authors have not only fully confirmed the most encouraging American findings about the blood levels attained but record their impression that a single daily dose of this product administered to out-patients with various septic conditions has been superior in effect to the previous system of giving a large dose of penicillin in saline twice daily. Even this is possibly not the last word, because Thomas and his colleagues[8] report that the addition of a water-repellent substance, aluminium monostearate, to suspensions of procaine penicillin prolongs their action even further. These preparations are said to cause no undesirable local reactions. Apart from their therapeutic merits they have an obvious advantage for patients in hospital as well as those at home, and for the nurses attending them. The present indications seem to be that the use of watery solutions of penicillin for any ordinary therapeutic purpose will be abandoned in the near future.

ACTION OF DRUGS ON THE HEART

Physicians in this country are sometimes criticized for being unenterprising compared with their fellows in the United States in their pursuit of new knowledge by clinical experimentation. This reproach certainly does not apply to Professor McMichael and his colleagues at the Postgraduate Medical School. In his Strickland Goodall Lecture, which is published as the opening paper in this issue, he gives an account of the action of "digoxin" and of g-strophanthin in patients with heart failure, using as a method of observation Forssmann's technique of right heart catheterization. In this procedure a catheter is passed into a superficial vein of the left arm and pushed upwards until the tip comes to lie at the junction of the superior and inferior venae cavae, where the mixed venous blood enters the right heart. A sample of blood is withdrawn through the catheter and its oxygen saturation determined. The same test is done on a sample of arterial blood, and the difference between the oxygen content of the arterial and mixed venous blood is calculated. The oxygen consumption of the patient per minute is measured at the time of withdrawing the mixed venous blood, and the cardiac output in ml. per minute is obtained by dividing this figure by the calculated difference in oxygen content between the arterial and venous blood. By measuring the cardiac output in this way and at the same time by determining the pressure in the right auricle Professor McMichael is in a position to say what effect a drug such as digoxin has on the performance of the heart.

Hitherto there has been some difference of opinion about the way in which the digitalis glycosides act. Mackenzie and Lewis both considered that the most important feature was the slowing of the rate; several pharmacologists have found evidence that in the failing heart the cardiac muscle is stimulated; lastly, following the work of Harrison and Leonard,[1] there has been a suggestion that through an action exerted elsewhere than in the heart the return of blood to the heart is impeded and in consequence its output is reduced. As a result of his observations McMichael divides cardiac failure with congestion and oedema into two groups: failure with a low output, due to hypertensive, ischaemic, and valvular heart disease, and failure with a high output, due to conditions which demand an increase in the output, such as anaemia or emphysema, arteriovenous aneurysms, Paget's disease of the bone, and metabolic disturbances like beriberi. He believes that in patients with heart failure with high output the action of digoxin is not on the heart but on the venous tone, causing a fall of venous pressure and consequently a diminution of cardiac output. He illustrates this by observations on a patient with heart failure due to emphysema in whom the administration of digoxin reduced the cardiac output within seven minutes of the injection from the high figure of 6 litres per minute to 4.5 litres. It is certain that the drug could have no direct effect on the heart in so short a time, and it exerts no known action directly on the heart that would lead to such a fall in output. If the method yields accurate results when applied to such a patient with both emphysema and heart failure the conclusion seems inescapable that McMichael is right in placing the action outside the heart.

His argument is more difficult to follow when he discusses heart failure with low output. In valvular disease the low output is accompanied by a high venous pressure, and three procedures can both raise the output and lower the pressure: (1) venesection; (2) the application of cuffs to the thighs to restrict the venous return; and (3) the injection of digoxin. McMichael found that the change in cardiac output produced by a given reduction of venous pressure when cuffs were applied was exactly the same as that produced by a subsequent injection of digoxin, and he therefore concludes that in low-output heart failure digoxin again acts primarily on the venous pressure. This argument will not convince everyone. When the frog heart is perfused with Ringer's solution at a known venous pressure, the output being measured from the aorta, the output rises as the venous pressure rises, until it can rise no higher. With a further increase of venous pressure the output falls. At this point the output can again be increased either by reducing the venous pressure (which is the effect of venesection or applying cuffs) or by injecting strophanthin without altering the venous pressure. The latter increases the force of the heart beat. Such an effect will still be regarded by many as the essential feature of the action of digoxin in low-output failure in man.

Describing the results obtained with g-strophanthin (ouabain), McMichael states that they show "clear evidence of a direct stimulating action of ouabain on the myocardium." He finds in about half the cases of heart failure there is a definite increase in cardiac output with only a very slight reduction in venous pressure when strophanthin is given. Thus the gap between McMichael and the pharmacologists begins to be bridged at this point, and it is at once interesting to note that all the pharmacological experiments on the effect of glycosides on cardiac

[1] *J. clin. Invest.*, 1926, **3**, 1.

output have been made with strophanthin, because digoxin takes so much longer to exert its effect. Since digoxin produces the same changes as does strophanthin when perfused in Ringer's solution through the isolated heart of the cat or rabbit, pharmacologists have assumed that the effect of the two substances on the cardiac output would also be the same. There seems to be need for further observations from both points of view. The pharmacologists must look for the rapid effect of digoxin in causing a fall of venous pressure in the normal animal and seek its cause, while the clinicians should see if a stimulating effect of digoxin like that of ouabain can be observed at a longer interval than 50 minutes after injection.

After discussing the action of theophylline, which causes a transient rise in the output of the failing heart and thereby reduces the venous pressure, McMichael describes some interesting observations on the action of mersalyl. His colleagues Pugh and Wyndham have found that the intravenous injection of this substance in an oedematous patient caused a fall in right auricular pressure and a rise in cardiac output reaching a peak seven hours after the injection. He concludes that "this is the first clear demonstration of a circulatory action of mersalyl." It should be noted that by the time the greatest cardiac output was reached the patient had passed 2 litres of urine. The more usual interpretation of the effect of mersalyl would be that the excretion of 2 litres of urine lowered the right auricular pressure and thus caused the rise in output. McMichael's exposition is, however, both stimulating and challenging. The pharmacologists will take no offence if on occasion he treats them with scant courtesy, for he is at long last obtaining the final answers on the question of drug action.

CENSUS OF CHILDBEARING

In one week in March, 1946, 16,695 births took place in England and Wales and Scotland. Eight weeks later 13,687 of the mothers were interviewed by health visitors about the circumstances of their confinement; roughly half of them were asked further questions on their use and experience of the maternity services, and the other half on the pounds, shillings, and pence of childbirth. The failure to interview 3,000 of the women was due to non-cooperation of 34 of the 458 welfare authorities and to the fact that 1,100 women were untraceable even after so short a time as two months. The health visitors were given a formidable questionary but managed to get through the 40 or more questions in an interview lasting on an average for 25 minutes. The inquiry was undertaken jointly by the Population Investigation Committee and the Royal College of Obstetricians and Gynaecologists, and the results are assembled and discussed in a most interesting social document.[1]

Over 99% of the expectant mothers came under antenatal supervision for some time. Local authority schemes provided for about 73% of them. Even one-third of the wives of men in the professional and salaried group received some of their supervision at clinics administered by local authorities, and this provision grew to two-thirds for the wives of black-coated wage-earners and to three-fourths for the wives of agricultural labourers. Before July 5 there was, of course, an incentive for the working woman to place herself under the antenatal care of the local authority because it often enabled her to book an institutional bed. It is doubtful if some local authorities are now in quite the same position to reserve maternity beds. On the average the mothers interviewed had attended for antenatal examination eight times and had made their first attendance 22 weeks before delivery—a great improvement on some Ministry of Health figures of ten years ago. In the present sample those who were attended by a private doctor came earliest under supervision (24 weeks on the average) and those attended by municipal midwives came latest (19 weeks). More than half the prospective mothers who consulted private doctors did so in the first trimester of their pregnancy, whereas more than half those who consulted municipal doctors or private or municipal midwives did so in the second trimester.

According to the report "the most satisfactory antenatal supervision is given at clinics." But attention is drawn to the unsatisfactoriness of some clinics. There is criticism of unsuitable buildings, temporary huts or sheds, draughty and cold, with no adequate privacy; small overcrowded waiting-rooms, with wooden benches; long waiting; and sometimes only a cursory examination. One woman complained of having to sit on a hard chair for two and a half hours; another said, "I had no time to visit the antenatal clinic. My own doctor was able to see me after work in the evening, and therefore I attended his surgery." One of the supposed advantages of a clinic, that it affords opportunity for group instruction, is acknowledged to be not very substantial, for teaching can hardly be given amid the continual distracting bustle of women coming in and going out. Whatever the basis for the view that the most satisfactory antenatal supervision is given at clinics, it is not clear how the 26% of women who received their antenatal care privately were at any disadvantage.

In this sample group of 13,000 women the proportion confined at home was 46.2%, in hospital 43.3%, and in nursing-homes 10.6%. Three-fourths of the wives of professional and salaried workers had hospital or nursing-home beds. The economic position of the household is an important factor in interpreting these figures, but it is not the only factor concerned. The better-to-do can afford a nursing-home and pay for domestic help during the lying-in period. It is very different with the working-class mother, especially when there are other children in the home, and for second and subsequent confinements the proportion taking place at home rises steeply. Generally, however, the choice between institutional and domiciliary midwifery is determined by availability rather than personal preference. In Norfolk, for example, a county of sparse population and poor transport, only 11% of mothers are confined in hospital; in Northumberland 48%. There are wide differences even between comparable cities. In Wolverhampton and Plymouth only a quarter of the births take place in hospital; in Liverpool and Bradford between one-half and two-thirds. Half the women interviewed in this inquiry made the bald statement that their preference was to be confined at home; some said they felt "safer" that

[1] *Maternity in Great Britain. A Survey of Social and Economic Aspects of Pregnancy and Childbirth*, 1948. Geoffrey Cumberlege, Oxford University Press. 12s. 6d. net.

way; more wanted to be near their family. It is evident that many women would prefer a good domiciliary maternity service, provided some domestic help were available and housing conditions were improved.

To judge from this sample, private practitioners are in charge of 32% of confinements at home and in a further 4% are called in by midwives on account of some abnormality. For first confinements only, the proportion attended by private practitioners is 40%. The committee in charge of this survey seems inclined to give the general practitioner a relatively unimportant place in obstetrics, and that for two reasons: because the presence of a doctor suggests an abnormal aspect of pregnancy, and also because it deprives midwives of an interesting and useful side of their work. But there is this dilemma, that if the general practitioner is denied a proportion of normal deliveries he cannot be expected to act efficiently in the abnormal case. With one-third of all domiciliary confinements in the care of private practitioners it seems hardly justifiable to talk about the small part played in midwifery by such practitioners or their lack of interest in the subject. Admittedly the doctor in charge of the confinement does not of necessity carry out the actual delivery, but even with this qualification such statements do not receive overwhelming support from this survey.

At almost every page of this report some revealing statistics are found. The number of stillbirths in this 13,000 sample was 320, and of neonatal deaths 358. Both rates were shown to increase with falling income. Premature births, as estimated by body weight, were 6.4% of the total. Women who worked outside the home during the last five months of pregnancy were more often found to have premature babies than those who had left work during the first four months. Of the women delivered in hospital only 52% received some analgesic or anaesthetic. The private doctor, when attending the wives of professional and salaried workers, gave analgesia in nearly three-quarters of the cases. The average time spent in hospital (counting the day of admission and the day of discharge as a single day) was 15.4 days, of which 13.1 days were subsequent to the delivery. In Scottish hospitals the average lying-in period is generally shorter (11 days). For the first time statistics on a national scale are given for infant feeding. Of the 13,000 women who answered the question 43% said that their infants were wholly breast-fed at the date of the interview, two months after birth. The proportion of bottle-fed babies is practically the same in all social classes, but here again there are extraordinary geographical variations. Why should 76% be wholly bottle-fed in Southport and only 15% in Lewisham, or 55% in Cornwall and 20% in West Sussex? The explanation presumably must be sought in the variable quality of maternity service provided. The report also goes into considerable detail concerning the cost of childbearing. The average outlay for all the 6,400 mothers who answered these questions was £31; very few spent less than £20, and the highest individual outlay was £208. Medical and institutional fees, of course, form only a small part of this expenditure, something like 20%; the heavy items are layette and equipment.

In this survey there is no extended reference to maternal morbidity following confinement, and no questions seem to have been addressed to the mothers on that subject. Perhaps two months was too short a time for useful information to be obtained on this point. A follow-up of maternal morbidity is in contemplation, as well as a study of social and economic factors which affect infant health during the first two years of life. This will help to complete the most thorough and objective survey of maternal and infant welfare so far presented to the public.

THE ANTI-PERNICIOUS-ANAEMIA FACTOR

In a recent annotation[1] we referred to the isolation by British and American workers of the anti-pernicious-anaemia factor from liver—named vitamin B_{12} by its discoverers. When given to patients with pernicious anaemia in minute doses of 3 to 6 μg. it produces a prompt increase in circulating reticulocytes, red cells, and haemoglobin. Elsewhere in this issue Dr. J. C. Patel reports good haemopoietic response to a single injection of 80 μg. of the substance in two cases of tropical macrocytic anaemia. Similar good results were obtained by Spies[2] and his colleagues in cases of nutritional macrocytic anaemia and in both tropical and non-tropical sprue. Lester Smith[3] and Rickes and his co-workers[4] have now shown that vitamin B_{12} is a cobalt co-ordination complex and that its red colour is due at least in part to its cobalt content. This metal has long been known as one of the trace elements essential for animal nutrition, but there has never been any proof that it is necessary for human health. When Spies and his colleagues reported in 1945 that folic acid restored the blood to normal in cases of pernicious anaemia it was at first thought that this might be the anti-pernicious-anaemia factor of liver. It was soon found, however, that unlike active liver extracts folic acid failed to prevent or alleviate the neurological complications of pernicious anaemia. Indeed, several workers suggested that folic acid appeared to hasten the onset of subacute combined degeneration of the cord in some cases of pernicious anaemia.

If vitamin B_{12} is the anti-pernicious-anaemia factor it should not only restore to normal the blood of patients with pernicious anaemia in relapse but it should also prevent the onset of subacute combined degeneration of the cord and produce some recovery of nerve function in patients with established lesions. In a letter commenting on the assessment of the value of haemopoietic substances in preventing or improving, if present, the neurological complications of pernicious anaemia Ungley[5] mentioned that three patients with subacute combined degeneration were improved by injections of vitamin B_{12} and that the degree of improvement was similar to that observed in comparable cases treated with crude liver extract. Castle, Denny-Brown, and their colleagues[6] at Harvard have confirmed this. They gave 5 μg. of vitamin B_{12} daily to a patient with pernicious anaemia in relapse and subacute combined degeneration. A haematological remission and rapid and marked improvement in the neurological signs were observed after only eight days' therapy. The patient relapsed when the treatment was stopped temporarily, but improvement occurred again when it was resumed. This same patient had developed neurological lesions while under treatment with folic acid. Spies and his co-workers[7] have recently reported that the severe glossitis, stomatitis, and other mucous membrane lesions complicating pernicious anaemia were relieved within 24 to 48 hours by

1 *British Medical Journal*, 1948, **1**, 889.
2 *Sth. med. J., Nashville*, 1948, **41**, 522.
3 *Nature*, 1948, **162**, 144.
4 *Science*, 1948, **108**, 134.
5 *Lancet*, 1948, **1**, 771.
6 *New Engl. J. Med.*, 1948, **239**, 328.
7 *Lancet*, 1948, **2**, 519; and *J. Lab. clin. Med.*, 1948, **33**, 1019.

treatment with vitamin B_{12}, whereas folic acid administered in very large doses for nearly three months was ineffectual. The severe mucous membrane lesions described by Spies seem to occur only in patients with achlorhydric pernicious anaemia and degeneration of the postero-lateral columns of the spinal cord.

Owing to the very limited amount of material available—four tons of liver yield only one gramme of active substance—the number of patients treated so far with vitamin B_{12} is small. Confirmation of the preliminary reports will have to await the results of treating a larger number of patients for at least 18 months to two years in order to be certain that no relapses occur during treatment and that signs of improvement in the nerve lesions are not due just to temporary remissions. But it does seem as if the anti-pernicious-anaemia factor of liver has been discovered at last after a 20 years' search. It is a definite chemical entity; it is active in doses of a few microgrammes; and it apparently controls all the lesions of pernicious anaemia. At the moment there is no question of its commercial issue, but if it could ever be produced as economically as liver extract the tedious and unsatisfactory assay of the latter on patients suffering from pernicious anaemia would be a thing of the past.

ANTI-ADRENALINE SUBSTANCES

Anti-adrenaline substances have been known much longer than antihistamine substances, which were in fact discovered in a search for new compounds with actions antagonistic to adrenaline. Dale described the anti-adrenaline properties of ergotoxine as long ago as 1906,[1] and subsequently several other substances with similar properties were found in nature. Various compounds have also been synthesized, including the derivatives of dioxane prepared by Fourneau and Bovet[2] in 1933. They are known by the numbers F883, F933, and F1164. Similar properties are possessed by the imidazoline derivative "priscol" and by "dibenamine" (N, N-dibenzyl-β-chloroethylamine). Like ergotoxine, these substances reverse the action of adrenaline on the blood pressure, so that when they have been injected a subsequent injection of adrenaline causes the blood pressure to fall. While thus diminishing or reversing the action of adrenaline they do not equally interfere with the normal responses to sympathetic impulses. The duration of action of the different anti-adrenaline substances varies, that of dibenamine being the longest. Nickerson and Goodman[3] state that if the injections are given slowly over 45–60 minutes the main effect lasts from 36 hours to five days and residual therapeutic effects from 7 to 10 days.

These substances have been used with success recently for diagnostic purposes. The number of patients with hypertension in which the cause is a tumour of the adrenal medulla appears to be increasing as diagnostic methods improve. It was formerly thought that these patients could be differentiated by the fact that their blood pressure was not continuously raised and that they suffered only from intermittent crises. Evidently this is not always so. Their blood pressure may be persistently high because of the constant presence of excess of adrenaline in the blood. Goldenberg, Snyder, and Aranow[4] have now described a new test for this form of hypertension. The patient is given a drip saline intravenously, and into this about 15 mg. of F933 dissolved in 1.5 ml. is slowly injected, not less than two minutes being taken to complete the injection. If the high blood pressure is due to excess of adrenaline there is a rapid fall of about 60 mm. in the systolic pressure, which then returns to its previous level in 20–40 minutes. If the hypertension is renal in origin there is no fall, and indeed there is sometimes a slight rise. By this test the presence of a phaeochromocytoma can be diagnosed and its complete removal ensured. Ganem and Cahill[5] record the case of a patient who still had a raised blood pressure eight weeks after the removal of such a tumour. A test of the kind described in which F1164 was used caused a drop from 160/144 to 100/60. A second operation was undertaken and a further tumour discovered; the removal of this was followed by uneventful recovery, and the blood pressure fell to 114/54. There seems to be no important difference between F933 and F1164 in clinical use. Both must be injected slowly, since they may cause tachycardia, flushing, and a feeling of fright. Such disturbing side effects do not often last longer than three minutes and rarely occur with slow injections.

1 *J. Physiol.*, 1906, **34**, 163.
2 *Arch. int. Pharmacodyn.*, 1933, **46**, 178.
3 *J. Pharmacol.*, 1947, **89**, 167.
4 *J. Amer. med. Ass.*, 1947, **135**, 971.
5 *New Engl. J. Med.*, 1948, **238**, 692.

EXPERIMENTAL MENSTRUATION

The premenstrual regression of the endometrium is generally thought to be a result of hormonal withdrawal, but Phelps[1] has emphasized that the condition of the endometrium before the application of the stimulus which produces the bleeding also affects the character of any given episode of bleeding, and she has recently reported[2] the results of further experiments carried out on ovariectomized rhesus monkeys. Using Markee's technique of intraocular endometrial transplants,[3] she studied the effects on the blood vessels of injecting ovarian hormones and found a constant pattern of vascular response to courses of oestrogen alone and of oestrogen and progesterone together. Differences in the duration of the resultant bleedings appeared to be due to variations in the vascular structure of the endometrium at the time the injections were given. From the results of further experiments Phelps inferred that injections of ovarian hormones produce permanent as well as transitory changes in the endometrial vascular bed—permanent in so far as they survive the subsequent period of regression. Moreover, these changes are greater and more prolonged when both oestrogen and progesterone are injected than when oestrogen alone is given.

This demonstration that the vascular changes brought about by hormonal stimulation of the endometrium can persist beyond the cycle during which the drugs are given may have clinical importance. For instance, the current view is that the administration of ovarian hormones produces only temporary benefit, or none at all, in such conditions as amenorrhoea, hypomenorrhoea, and uterine hypoplasia. Perhaps better results would be obtained by giving oestrogen and progesterone in cyclical fashion instead of oestrogen alone, and by continuing the courses of treatment longer than the customary three months. The work of Okkels and Engle[4] provides further support for the latter suggestion. It becomes apparent too that possible variations in the pre-existing vascular structure must be taken into account when assessing clinical or experimental evidence of the action of any hormone on the endometrium. Such variations may be the reason for the inconsistent results obtained in the treatment of amenorrhoea.

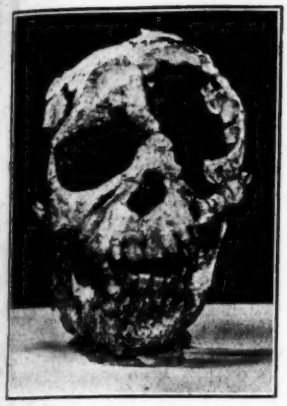
The experimental work referred to is concerned with only one aspect of a many-sided problem—namely, the part played by the vascular structure of the endometrium. In the study of the mechanism of menstruation and its disorders at least three groups of factors must be taken into account—the endometrial, neuromuscular, and vascular constituents of the uterus; the secretions of the endocrine glands; and the receptivity of the uterine tissues to hormonal stimulation.

1 *Endocrinology*, 1946, **39**, 105.
2 *J. clin. Endocrinol.*, 1947, **7**, 611.
3 *Contrib. Embryol. Carneg. Instn.* 1940, **28**, 219.
4 *Acta path. microbiol. scand.*, 1938, **15**, 150.

APE SKULL OF THE MIOCENE AGE

Rusinga Island Fossils

Professor W. E. Le Gros Clark, of the Department of Human Anatomy, Oxford, gave an address at a Colonial Office press conference on Nov. 17 on a skull of the Miocene Age which has been discovered by Dr. and Mrs. L. S. B. Leakey, of the British-Kenya Miocene Expedition to Rusinga Island, Lake Victoria. Professor Clark explained that some two hundred fossil specimens, mostly fragments of jaws and teeth, had already been brought to this country from East Africa, and geologists agreed that they dated from the Miocene Age. They belonged to apes of various sizes, from something like the small gibbon to something like the giant gorilla, but their relationships had been determined on the pattern of the teeth and nothing was known of the rest of the animal.



The skull now discovered belonged to a more primitive form of ape than the present primates. All existing apes were rather specialized, with their atrophied thumbs, large eyebrow ridges, and strong canine teeth, but the ancient apes had not developed these divergent characteristics. Thus, with the help of this newly found skull it had become more easy to picture the evolution of man from a common apelike ancestry. The presumption was that somewhere among these groups there was a remote ancestor of the human family, but man and the anthropoid ape had each developed their particular specialization. If they were traced back it might be said that with increasing remoteness the ape became in a negative sense more manlike in appearance and man more apelike. The Miocene period was placed by geologists at between 35 and 15 million years ago, and judging from the deposits from which this skull was taken it was probably at least 20 million years old. Man as now known did not develop until about one million years ago. Nevertheless, there were features in this skull which were curiously human, not in any special relationship to man as he now was, but because the ancient apes had certain primitive features since lost to the ape while retained, so to speak, in the human evolution. This was not a heavy skull with pronounced eyebrow ridges. It belonged to a small ape, in size somewhere between the gibbon and the chimpanzee. There was a rather specialized projection of the jaw, the canine teeth were of small size, and markings in the brain case suggested a rather poor development of the frontal lobe, in this respect rather resembling the monkey. Other features, such as the narrow nose-opening and muzzle, belonged to the monkey rather than to the anthropoid ape pattern. Here was evidence bearing out the probability of the anthropoid ape having developed from a monkey-like ancestry.

Professor Clark added that this was the first time that the skull of an ape of the Miocene period had been found. The lesson to be learned from it was that these creatures in their earlier form were not specialized animals such as the modern anthropoid ape. It was possible that the particular group to which this skull belonged was ancestral to the chimpanzee. It was an agile animal, though it was unlikely that it adopted the upright position. He thought it must have been more like the chimpanzee than any animal now known. Somewhere in this great diversity of apes in East Africa and other parts of the world, animals less differentiated than any of the primates as now known, was a group which gave rise eventually to man himself.

The skull will be the property of the British Museum.

Cheeloo University College of Medicine, China, has moved from Tsinan to Foochow and has started the autumn term with 101 students enrolled. Clinical work will be done in the three mission hospitals—the Union Hospital, Christ's Hospital, and Tak Ting Hospital.

PSYCHIATRY AND THE CRIMINAL LAW

A MAUDSLEY LECTURE

Mr. Claud Mullins, former Metropolitan police-court magistrate, delivered the twenty-third Maudsley Lecture before the Royal Medico-Psychological Association on Nov. 12. In a discourse on "Psychiatry and the Criminal Law" he introduced himself as one who must not be regarded as typical of either lawyers or magistrates, and whose opinions were not at all popular in his profession.

Fitzjames Stephens, Mr. Mullins continued, declared that it was highly desirable that criminals should be hated, and that the punishment inflicted on them should be so devised as to give expression to that hatred. That idea was still very largely the prevailing one. On the other hand, the probation system was the most helpful and constructive, and incidentally the cheapest, way of dealing with offenders. All criminal courts should have the power to place offenders on probation, except in cases of murder and a few other offences.

In Mr. Mullins's view a primary weakness in our present system was that the sentence was passed immediately after the verdict, which meant that information about the offender's social, and in some cases medical, history must have been obtained before the trial took place; yet a person was deemed innocent until proved guilty. It was intolerable that police and probation officers should make investigations about a person, his working conditions and his record, before the court's decision on the case. An elementary knowledge of the principles of psychiatry should deter those on the bench from making an assessment of human personality. Yet courts of quarter sessions and even assizes often lasted no longer than one day or part of a day, and there was no time for inquiries after the finding of guilt if the court was to say what was to be done with the offender. The new Criminal Justice Act contained nothing to prevent the courts from continuing in the same way and sentencing the offender immediately after the finding of guilt. Time should be given after the verdict for judicial anger to abate, and perhaps for the guilty person to realize the harm that he had done to the community and to himself.

Punishment and Treatment

Punishment and treatment were not necessarily alternatives, and if the punishment won the criminal's approval, as it should, he was on the way to rehabilitation. Of course, many other considerations came in. Mr. Mullins recalled being reproached in court by the father of a boy who had been the victim of a criminal assault, the father saying that the magistrate, in dealing with the offender in a certain way, cared more for him than for his son. When courts passed severe penalties they undoubtedly satisfied the public, and perhaps the bench satisfied its own feelings as well. Mr. Mullins agreed that there were crimes which, in the interests of society, had to be severely punished, even if this was against the offender's own interests, otherwise how were the public to learn generally that crime did not pay? There were also crimes—for example, many sexual crimes—which in themselves indicated the need for psychiatric treatment. All first offenders, and most second and third offenders, should be offered psychiatric examination, and treatment also where necessary, whether on probation or in some institution. In a recent year, of persons found guilty of indecent assault on a female 51% had been sent to prison, and among those found guilty of unnatural offences the proportion sent to prison was still higher. But he recalled the case of an exhibitionist, a man aged 58, who had served five sentences of imprisonment for that offence, for whom at last it was possible to enlist psychiatric aid, and he had made excellent progress during two and a half years. It could not be claimed that he was cured, but he was definitely better than when first seen.

The new Criminal Justice Act brought about better conditions, but much depended upon the willingness of the courts to use their optional powers. Under the old Probation Act, 1907, there was an omnibus power which some magistrates employed to bring in psychiatric treatment, but now that this was more plainly set out in the new Act more extensive progress, if not rapid improvement, might be expected.

Reform in Criminal Procedure

Mr. Mullins considered that there was urgent need for detailed examination by a group of psychiatrists, preferably of different schools, of the whole question of criminal procedure, too long the monopoly of lawyers. The psychiatrist would find much that was admirable in the present system, but much also that would benefit by his constructive criticism. At present the acquittal of guilty persons undoubtedly took place. Without endangering the innocent, more could be done to bring the guilty to justice. Lawyers might be content with an acquittal against the evidence, regarding it as a triumph for the defence, but the psychiatrist would look upon it as a failure to provide treatment—a lost opportunity of treating a dangerous man who was a menace to the community. The psychiatrist also would quickly discover that in all courts offenders were sentenced by those who had had no training for this part of their duties. Who would be bold enough to recommend the education of judges and magistrates in this respect? The question of sentence might suitably be transferred to a board of experts.

He looked to a future in which fuller use would be made of psychiatry in dealing with those who had broken the criminal law. In proportion as constructive treatment was accepted and mere punishment diminished, those who had committed offences would be more likely to admit them. It was largely fear of punishment, arbitrary and with no reference to treatment, which deterred them from admission. In that utopian era there would be far greater protection for the public. He feared that the principles of psychiatry in the future as in the past would only slowly insinuate themselves into criminal law, but psychiatrists should not be deterred by the distance they had to travel nor the difficulties they were likely to encounter.

Reports of Societies

SHOULD A DOCTOR TELL?

HUNTERIAN SOCIETY DEBATE

"That the practice of instructing the layman in the nature and treatment of disease is being carried to excess." This was the motion for debate at a meeting of the Hunterian Society held at the Apothecaries Hall on Nov. 15. The proposers of the motion were Dr. W. J. O'Donovan and Miss Arnot Robertson, writer and film critic, and the opposers were Dr. Charles Hill and Miss Bronwen Lloyd-Williams.

Dr. O'DONOVAN began by suggesting that with the frequent changing of medical theories and practice the medical profession themselves saw things only "through a glass darkly," and therefore could not well impart what they had only imperfectly grasped. An Irishman, "who had done more harm to the medical profession than any Welsh miner," had held up to derision the quasi-omniscience of the profession in *The Doctor's Dilemma*. The claim of the profession to instruct the public, therefore, must not be taken as well founded. True, if all instructors were like the Radio Doctor, imparting wholesome knowledge with the unction of an archbishop, all might be well, but there were others, some of them his disciples and followers, and others who had been in the field before him, who bewildered the public with their advice on every subject from skin rashes to mental healing.

Is the Public Teachable?

But what about those who were to be taught? Dr. O'Donovan said that before he himself learned medicine he had to undergo the discipline of the classics, and also to submit to instruction in chemistry and biology, in anatomy and physiology; but in this teaching of the public the mysteries were to be made plain without any such groundwork, and the results would be sometimes disastrous. He recalled the manner in which medical knowledge was imparted wholesale to the troops in the war, when a disease of the stomach which he himself had never heard of was described to medical boards by thousands of well-taught young soldiers, who convinced the boards, physicians, radiologists, and all that they had "gastric stomachs" and were unfit to serve His Majesty in places of danger.

The experience of all doctors was that many people suffered from mental tension and were on the look-out for material with which to feed their anxious egos, and if such people were "instructed" their last state would be worse than their first. Such instruction went out in books and pamphlets, in universities and evening classes, and so potent was its effect that the young and simple now came before great doctors and assured them that they suffered from inferiority complexes and maternal fixations.

Solomon said that with increase of knowledge went increase of sorrow. It was certainly so with tuberculosis. With the knowledge of consumption had grown the fear of it, so that now the consumptive was an object of dread and abhorrence to his friends and neighbours. The patient with lupus vulgaris was almost an outcast. Should this spread of knowledge, then, be stopped? The answer was purely pragmatic. It depended upon what use was made of the knowledge. If the use was dubious, harmful, or mischievous, then it should not be imparted. The sons of Hippocrates above all others should do no harm.

Dr. O'Donovan repeated that the whole truth of medicine could never be appreciated by those who had not been subject to its discipline. "You may look at my learned friend (Dr. Hill) and say that he is a master of diction, that his logic is unassailable, his facts beyond cavil. That may well be. But how many of you in this hall would step to the microphone and make a practice of teaching the public medicine in such a way that even the most timid would not be made more afraid?" That the public had not digested what they had already been told was evident from the way in which they had shown themselves indifferent to the claims of medicine when the body of the profession was on the floor of Parliament. That showed him again how unteachable they were.

If people with the highest motives sought the fount of knowledge to learn medicine in the pursuit of truth, he would gladly pass on such grains of knowledge as had adhered to his understanding. But what medicine was it, what pathology, for which they were most avid? Murder most foul—"Arsenic and Old Lace." For that there was a greedy multitude.

Medicine Not a Close Preserve

Dr. CHARLES HILL recalled the meeting to the proposition stated in the motion. The mover, he said, had given reasons why medical knowledge should be a preserve of the medical profession. Underlying his speech was a contempt for the intelligence of the people who had not undergone a medical discipline. Dr. Hill agreed that the instruction to be given should proceed only to the extent to which it was useful. But the work of health education, advice to the public on the prevention of disease, demanded some measure of explanation of the facts imparted. Few would deny that it was useful to describe the bacteriology of diphtheria in justifying immunization. The people of this country more and more welcomed an appeal to their intelligence. That was the way not to create fear but to dissipate it.

"As a profession we ought to regard this body of knowledge which is ours as something capable of conveyance to ordinary people. We ourselves expect to gain a working knowledge of other fields of experience, but we assume that we alone are capable of understanding the mysteries of the human body." Was it useful and right for people to know how the body worked in disease and in health? Clearly there were immense dangers. People were intensely interested in disease. The majority of them "enjoyed bad health." Symptoms of disease presented a conversational opportunity never to be missed. But the medical profession could do much by explanation in simple and unemotional terms to allay morbid fears and morbid interest. To withhold such knowledge was only to leave ever more widely open to the vendors of patent medicines a public interested in its complaints. As for the suggestion that the teaching of disease processes encouraged the neurotic, he thought that the neurosis was there anyway. The teaching of the disease processes of cancer, for example, if wisely handled, could do much to alleviate the fear of cancer which lurked in the minds of most adult people and at the same time would lead many cancer subjects to seek the early treatment which was their only hope of cure.

Taking the Patient into Confidence

Dr. Hill believed also that the individual doctor—as many did—should explain his instruction and his diagnosis in a proper way to the appropriate patient. A great deal of harm could be done by the silence of the doctor—a silence often interpreted by the patient in a manner quite unjustified by the facts of the case. The surgeon who was contemplating doing a gastro-enterostomy might quite well explain to the patient exactly what he proposed to do and why. The assumption that ordinary people could not take ordinary explanations was ill founded. There was danger, of course, in an excess of frankness, but in general it would be wise in the interests of health education and of growing knowledge to explain what in fact was happening in both health and disease. The patient had a right to know what the doctor had found by examination.

It was of no use putting up posters, "Coughs and sneezes spread diseases," without explaining the process of droplet infection, or saying that bovine tuberculosis could be prevented without explaining the bacteriology of infected milk. Dr. O'Donovan himself as a dermatologist would be doing great service by dissipating the common belief that all skin diseases were infectious. A better doctor-patient relationship would be established if doctors were a little more forthcoming. It was unfortunate that the idea should spread that medicine was a closed corporation, that they were high priests with a sacred body of knowledge and a contempt for the public intelligence. The public had a right to know many of these things, and was not nearly as squeamish and as fearful as was supposed. "Let us ring up the curtain a little. Let us hear a little less of the profession's inability to give and the public's incapacity to receive, and let us regard the public as not less intelligent than ourselves."

Lay Voices on Both Sides

Miss ARNOT ROBERTSON, who supported Dr. O'Donovan, related some amusing examples of the grotesque bits of medical knowledge that lay people picked up. One of them concerned a charlady whose young child, just vaccinated, came out in a black rash. "I went to St. Thomas's," said the angry lady, "and I got all the doctors in front of me." "All of them?" "Yes, all of them in a line in front of me, and they admitted they had vaccinated my child with lymph from a black man's baby!" She mentioned less fantastic instances of friends who were suffering from hypochondria as a result of the barrage of suggestion to which they were subjected on the radio and in the Press, both popular and scientific. She herself was a doctor's daughter, and had been brought up with a complete contempt for "coloured water in bottles." No medical knowledge of any kind came into the nursery of her childhood, and to this she attributed whatever health and strength she now possessed. But what happened now? People were given a certain amount of knowledge which made them afraid of more. Fear was increased and treatment was delayed. Happy were the days when it was thought the doctors knew everything, but now the man who had a pain in his stomach did not want to be prodded by old Dr. A, he would go to Dr. B, who would possibly invent something he had not got, or very likely, having listened on the radio, he would treat himself, which was cheaper.

Miss BRONWEN LLOYD-WILLIAMS spoke in the opposite sense. She gently reminded Dr. O'Donovan that the scriptural passage he had quoted also referred to the putting away of childish things. A little knowledge might be dangerous, but ignorance, to her mind, was very far from bliss. The analogy between the body and a machine was often made, and in fact the body was a frequently overdriven machine on which every one of them ought to be able to do rough and ready repairs and to know when to call in an expert mechanic. Recognition of disease by the patients themselves or by a relative was a real help and often meant prolongation of life. Like Dr. Hill, she pleaded for better co-operation between doctor and patient.

In the course of some general discussion Mr. DICKSON WRIGHT said that the hardest patients to deal with were those who knew something about the subject. Two countries far ahead of ours in instruction of the public in physiology, anatomy, and disease were Germany and the United States, and in those countries there were more quacks and patent medicines and extraordinary treatments than anywhere else in the world. The less people knew about the working of their insides the happier they would be.

Dr. KENNETH MCFADYEAN said that it would be a long time before the injury done by the "education" of the public in regard to sulphapyridine and also in regard to the radium treatment of cancer was overcome.

Cut and Thrust

Dr. O'DONOVAN, in reply, described as "the claptrap of the politician" the claim that the public had a right to know about these things. Medical practitioners had acquired knowledge by toil and tears, and the public claimed a right to the knowledge without either. The other side had spoken of the mysteries of medicine. If they were mysteries, how could they be taught to the unlearned? Perhaps the person in history who had had most to do with the organization of public health in this country was Florence Nightingale, who brought into the camp at Scutari and into our slummy hospitals the ways of living of middle-class people. She had no knowledge of professional hygiene and to the end of her life refused to believe in bacteriology altogether. We had seen the reign of the bacteriologist followed by that of the biochemist, and that in its turn had been followed by the reign of the psychiatrist, and soon no doubt it would be the turn of the geneticist—all prophets in their time, preaching part of the gospel of health, but how could all this be communicated to a cinema-going public of the average age of eleven?

Dr. HILL, in an equally vigorous reply, agreed that the progress of education left much to be desired, but to build a case on a contemptuous attitude towards ordinary people was to condemn it from the start. It was not true to say that the working of the body in health and disease was not communicable. It was that sort of superior attitude that led to the people as a whole regarding the medical profession with suspicion, and at times of crisis with hostility. He had assumed that the wording of the motion was aimed at instruction by members of the medical profession, which it declared was given in excess. Both sides would condemn ill-informed and unqualified instruction given in the Press or by other means. But the medical profession was not the providential depositary of all the world's intelligence. Mr. Dickson Wright's attitude was, "Tell 'em nothing; it's quicker and it saves time." No doubt, but in a proper way and in selected cases they should as a profession make an effort to instruct the public in the normal working of the human body and to a certain extent its working in disease. He asked the audience to reject the motion and the arguments, based on a contempt for the public, by which it had been supported.

The motion declaring that the practice of instructing the layman in the nature and treatment of disease is being carried to excess was put to a show of hands and lost, 41 voting in favour, and 56 against.

ANTI-VITAMINS

NUTRITION SOCIETY CONFERENCE

A conference of the Nutrition Society on "Anti-vitamins in Food" was held at the Royal Society of Arts on Oct. 23. Sir EDWARD MELLANBY, who was in the chair, emphasized the importance of the general principles underlying the biological action of anti-vitamins. About twenty years ago his experiments had convinced him that cereals, especially oatmeal, contained "toxamins" which were antagonistic to the action of vitamins. This theory at first attracted little support, but clear evidence was later obtained that the phytic acid present in cereals was strongly antagonistic to the action of vitamin D. The significance of the biochemical competition between vitamins and their corresponding anti-vitamins was now fully recognized, and the practical implications were extensive.

Dr. L. J. HARRIS traced the historical development of the anti-vitamin theory from its earliest stages. Eijkmann, in his classical work on polyneuritis in fowls, had concluded that

the disease was caused by a toxic substance present in polished rice, an antidote to which was contained in the polishings; nutrition was therefore adequate when unpolished rice was given. Later Hopkins developed the simpler concept of "deficiency" diseases. While Hopkins's theory was correct in general principle, evidence had accumulated to show that the effects of deficiency of a vitamin might be emphasized both by anti-vitamins, as conceived by Mellanby, and sometimes by certain major components of the diet. Thus modern research had shown that a diet rich in carbohydrate necessitated a high intake of vitamin B_1. Eijkmann was therefore correct in supposing that the polished rice which he gave to his fowls contained a factor, actually starch, which had to be counterbalanced by a factor present in the polishings.

Vitamin Requirements

It was now known that the vitamin requirements of the organism might be affected by numerous factors, in addition to the structural analogues of the vitamins, which were absent from ordinary foodstuffs. Thus vitamin A requirements depended *inter alia* on whether the preformed vitamin or carotene was the main source, on the proportions of the various carotene isomers which were present, on the physical state of the carotene in vegetable tissues or in oily solution, and on the ability of the particular species of animal to absorb carotene and convert it to vitamin A. Vitamin D requirements depended on the amounts of calcium, phosphorus, and phytic acid in the diet, on the degree of exposure to sunlight, and on many other factors. It was obvious, therefore, that chemical and biological tests for the vitamin contents of foodstuffs would sometimes give widely divergent results. When data on the vitamin values of foodstuffs were given it was essential that adequate indications of the method of estimation should be appended.

Dr. E. KODICEK, discussing anti-B-vitamins, enumerated the factors, apart from deficiency of a particular vitamin, which might result in the development of a deficiency syndrome: (1) Substances or bacteria might destroy or inactivate the vitamin; (2) bacterial growth might be inhibited by the presence of some antagonistic substance or the absence of an essential metabolite, with failure to produce vitamins required by the host; (3) the absorption of the vitamin through the intestinal wall might be impaired; (4) the vitamin, when it had reached the tissues, might be displaced by structural analogues from the surfaces where it catalysed biochemical reactions; and (5) the metabolic cycles in which the vitamin took part might be subjected to special stresses, such as infections, pregnancy, and imbalance of amino-acids, carbohydrates, and fats, with the result that the need for the vitamin was increased.

Toxamins and Analogues

The term "toxamin" might well be applied to all substances antagonistic to the action of vitamins, while "anti-vitamin" might be reserved to describe those structural analogues which acted by displacing the vitamin from active surfaces. The sulphonamide drugs were thus typical anti-vitamins, since Woods and Fildes had proved that they acted by competing with para-aminobenzoic acid, a substance which had been later classified as a vitamin. Numerous structural analogues to aneurin, riboflavin, pteroylglutamic acid, nicotinic amide, biotin, vitamin B_6, pantothenic acid, inositol, and choline had been synthesized, but had proved of little value as antibiotics. In addition many natural toxamins had been described, including the thiaminase of live yeast and a factor present in fern which antagonized vitamin B_1; a factor in maize which antagonized nicotinic amide; avidin in raw egg white which antagonized biotin; and lycomarasmin, present in a fungus pathogenic to tomato plants, which antagonized the bacterial growth factor streptogenin.

Professor P. MEUNIER, of Lyons, summarized his investigations on antagonists to vitamin K. In experiments with rabbits synthetic products, including phenyl indanedione, were found to cause a prolongation of the clotting time, although they were less effective than dicoumarol. The hypoprothrombinaemia could be corrected by massive doses of synthetic vitamin K.

Phytic Acid

Professor R. A. MCCANCE outlined the history of the discovery of phytic acid, a phosphorylated form of inositol, as an antagonist to vitamin D. In 1920 Mellanby noticed the anti-calcifying properties of cereals; oatmeal was particularly harmful, while wholemeal wheat flour was more rachitogenic than white flour. In 1930 Bruce and Callow recognized the anti-calcifying properties of phytic acid, and later Harrison and Mellanby found that this substance had the same effect as cereals when given to dogs. Evidence that flour of high extraction rate interfered with the absorption of calcium by humans was obtained by McCance and his colleagues in an experiment in which they subsisted on a diet consisting mainly of wholemeal bread; later a diet of nothing but wholemeal bread and water for three weeks was found to cause marked hypocalcaemia, as manifested by severe cramps. The increase of rickets in Eire following the use of coarse flour emphasized the possibility that phytic acid might become a real danger to health in Britain, and the decision to add calcium to our national flour therefore seemed amply justified.

Dr. S. K. KON described experiments on the value of yeast as a foodstuff for pigs. When large amounts were given the animals developed rickets, but they remained healthy if vitamin D was given in addition to the yeast. It might be significant that dried yeast had been reported as inhibiting the enzyme phytase, which hydrolysed phytic acid. Feeding with yeast also affected vitamin A metabolism, as indicated by a decrease in the reserves stored in the liver.

Dr. T. K. EWER spoke on the rachitogenic effect of green fodder for sheep. Flocks in the south island of New Zealand had to be fed upon fodder crops, and when given green cereals, particularly oats and barley, they often became lame. *X*-ray examinations indicated rickets, and the symptoms responded to vitamin D in various forms. Sunlight, however, was useless in the treatment or prevention of the disease; the symptoms were most severe when good weather caused a rapid growth of the young crops.

Vitamin Imbalance

Dr. T. MOORE discussed imbalance of fat-soluble vitamins, including the effects of toxic overdosage with one vitamin and the effects of excess or deficiency of various other nutrients on the activity of the fat-soluble vitamins. Thus great excess of vitamin A when given to rats caused skeletal fractures and haemorrhages which were suggestive of scurvy, while in America scurvy had been diagnosed in a child who had been grossly overdosed with vitamin A. It had also been claimed that vitamin A deficiency caused a secondary deficiency of ascorbic acid, but the significance of vitamin C in both excess and deficiency of vitamin A remained unconfirmed. Hypervitaminosis A, however, certainly led to secondary deficiency of vitamin K, as indicated by a delayed clotting time of the blood which could be corrected by giving the vitamin. There was also ample evidence that the demands of the organism for vitamin A or carotene might be influenced by numerous unrelated factors such as the adequacy of the diet in vitamin E, the ingestion of liquid paraffin, and the action of toxamins.

Hypervitaminosis D was characterized by excessive calcification, and imbalance of this vitamin had been put to practical use by Charpy and Dowling in the treatment of cutaneous tuberculosis. Liability to many of the abnormalities typical of experimental vitamin E deficiency, including resorption of the foetuses, testicular degeneration, muscular dystrophy, brown pigmentation, exudative diathesis, encephalomalacia, renal lesions, and the uneconomical use of protein and vitamin A, had been shown to be influenced considerably by other dietary components. Thus the abnormalities were often intensified by lack of protein, excess of cystine, and particularly by the inclusion in the diet of large amounts of cod-liver oil or other highly unsaturated fats. Protection against the abnormalities, on the other hand, might sometimes be effected by removing fats from the diet or, alternatively, by the administration of substances facilitating the mobilization and transport of fat in the body, such as choline, methionine, inositol, or additional protein. In summarizing the day's proceedings Mr. A. L. BACHARACH commented on the many instances of anti-vitamin activity which had been discussed. He considered that the conference had fulfilled a most useful purpose in collecting together and co-ordinating all available information.

Correspondence

R.M.B.F. Christmas Gifts—A Reminder

SIR,—At Christmas, 1947, each of our regular beneficiaries received a Christmas gift of £5 from the Royal Medical Benevolent Fund, and these gifts gave great pleasure and help to all.

Christmas, 1948, is now near at hand, but the response to my appeal made in October has not yet reached the sum required. I feel sure that no one would want the amount of the gift to be reduced, and therefore I beg those of your readers who have not sent a contribution to do so as soon as possible. Contributions should be marked "Christmas Gift" and sent to the Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, and will be gratefully acknowledged.—I am, etc.,

WEBB-JOHNSON,
President, Royal Medical Benevolent Fund.

The M'Naghten Rules

SIR,—May I protest at the complacent attitude which you adopt towards the M'Naghten rules (Nov. 13, p. 882)? Surely no one can be found to agree that "in practice they work unexpectedly well." There has been case after case in which the murderer has been stated by a competent psychiatrist to be insane, but on the opinion of the prison doctor (who is usually a general practitioner without psychiatric experience) the issue has been placed in doubt. The M'Naghten rules have been produced and the prisoner found guilty.

If a patient came to one and stated that his father had been insane and he himself had impulses to murder children, would any psychiatrist hesitate to certify him? Of course not. Yet if he does the murder and is seen afterwards he is found guilty of malice aforethought and hanged.

Patients are certified because they are dangerous to themselves or others or in need of care or treatment. Surely the rule that if a man is medically certifiable he is legally irresponsible should be established. It is time that psychiatrists stood out against the anachronism of the law and that the M'Naghten rules were abolished.—I am, etc.,

London, W.1. CLIFFORD ALLEN.

Medical Films

SIR,—In a report on medical films (Oct. 30, p. 796) it is stated that a film demonstrating subtotal hysterectomy for multiple fibromyomata "exemplified the high level of cinematic technique now attained." It was a very pretty coloured film, but, apart from the fact that not every gynaecologist agrees that a "subtotal" is the correct treatment for this condition, did it teach a postgraduate anything? In my opinion it did not give sufficient detail to be of any value to a postgraduate specializing in gynaecology. Films as an aid in teaching are invaluable and have been much neglected in the past, but before making a film it is essential to decide exactly what points are to be demonstrated. There is still much to be learned as to the best technique that is required for teaching purposes. To make a film of an operation being performed is not sufficient.—I am, etc.,

London, W.1. MALCOLM DONALDSON.

Marxist Genetics

SIR,—I have read both the report of Professor Lysenko's speeches, published under the title *Soviet Biology*, and Dr. Darlington's review in your columns (Nov. 13, p. 862), and I would like to make, not as an expert geneticist but merely as one who can read, the following criticisms of the review.

Dr. Darlington has written articles in journals from *Discovery* to *Nineteenth Century*, and his views were well known before the publication of the speeches gave the general reader the chance to make up his own mind. He is about as unbiased on Lysenko as Shaw would be reviewing a treatise on vivisection. He cannot be regarded as a "reviewer" but only as an opponent of Lysenko's work. The general tone of his article is that Lysenko is an authoritarian egoist not even above murdering or imprisoning his opponents. According to Dr. Darlington he "deals with the new epoch which *he* has created for science in the Soviet world."

There is then no fair effort to report Lysenko's arguments or refute them scientifically. Indeed, some of your reviewer's statements indicate that he is either distorting what is in the book or, worse, that he has not read the book he is "reviewing." For example, after inventing a rigmarole about deletions by the Communist Party from the speech, he writes, "One such deletion will be obvious to Lysenko's admirers abroad. There is no reference to last year's uncensored revelation—the notion that there is no competition within species." On p. 38, however, you will find Lysenko saying, "After a deep and comprehensive investigation I have come to the conclusion that there exists no intraspecific struggle but mutual assistance among individuals within a species."

Again, it is suggested that Lysenko regards the chromosomes as "idealistic metaphysical bodies," whereas, in fact, he says (p. 43), "We recognize the chromosomes. We do not deny them. But we do not recognize the chromosome *theory* of heredity. . . ."

Now Dr. Darlington has been writing on these matters—according to his references in the letter to the *Journal* of Nov. 29, 1947 (p. 886)—since February, 1947. A year ago he wrote, "The leading Russian geneticists . . . have been liquidated. . . . These [i.e., Mendelist versus Michurinist genetics] are no longer questions which can be argued about in Russia. All those who have been prepared to argue have been put away." And yet we find present at the meeting in August, 1948, and arguing, I. I. Schmalhausen (professor of Darwinism, Moscow), B. M. Zavadovsky (professor of biology, Moscow), P. M. Zhukovsky, A. A. Malinovsky, Professor N. P. Dubinin, Professor I. P. Polyakov, Professor Y. Polyansky (Leningrad), and Professor A. R. Zhebrak (for whose life Dr. Darlington purported to fear in his letter already mentioned). All the above, among others, are mentioned in the speeches as opponents of the Michurin school.

Finally, Lysenko himself says (again in August, 1948), "The chromosome theory of heredity is to this day taught in all the colleges of biology and agronomy . . . whereas in fact the study of Michurin genetics has not been introduced at all." This was nearly a year after Dr. Darlington had "liquidated" all the Mendelist teachers. Apparently as they did not stay "liquidated" that time, in his recent review he does it again.

Throughout the speeches it is Michurin who is eulogized, and I can find no references which indicate that Lysenko claims credit for even the basis of the new theories, let alone for creating a "new epoch."

While Dr. Darlington's views can only be regarded as propagandist, there seems to be no doubt that there are scientific criticisms that can be made of Lysenko—and indeed they appear to have been discussed in Russia. I would like to read a fuller version of Lysenko's own views in translation, and to see a report of his opponents' speeches at the Congress. The *British Medical Journal*, one of the medical publishers, or the Society for Cultural Relations with the U.S.S.R. would do well to publish these works and give us a clear and complete view of at least one aspect of life behind the so-called "iron curtain."—I am, etc.,

Burley-in-Wharfedale, Yorks. ASHLEY A. ROBIN.

Fibrositis

SIR,—The letter of Dr. M. G. Good (Oct. 23, p. 761), while offering a vague and unconvincing explanation for vasoconstriction, now completely ignores the need to explain the vasodilatation. The latter factor, when it was known "that rheumatic diseases do abound," was first brought forward by Hoffmann[1] (1660–1742). It is therefore not new.

As there is less need in the young than in the aged patient for multiple diagnoses, our problems are more likely to be solved by considering a lesion where several structures having more widespread effects meet. Now, opposite the intervertebral disk, in the lower cervical region at least, the transverse diameter of the intervertebral foramen—in view of the meningeal coverings present—is about 5 mm. or less *at rest*. As the result of prolonged degenerative processes or a more severe single trauma the disk gives way and the vertebral bodies are approximated. Their connecting ligaments and muscles are now (relatively) slightly too long, and the marginal lipping which forms as the result of the friction during movement encroaches upon the entrance to the intervertebral foramen and at the same time irritates the filaments which form the roots. More laterally the ganglion—the largest component of the canal—or any of the other nervous structures, including both the anterior and the posterior primary rami, may be affected by osteophytes in that

region. In scoliosis, where the joint cartilage may articulate partly with cartilage and partly with bone, secondary osteo-arthritis may occur, with or without lateral disk prolapse after a small trauma.

An explanation of most of the peripheral muscle, ligamentous, and other phenomena becomes more logical if considered in the majority of cases as follows. Other points correspond.

Vasoconstriction.—This results from irritation of those roots which have vasoconstrictor fibres or paralysis of the vasodilator nerves.

Vasodilatation follows the irritation of antidromic vasodilator nerves or fibres in the posterior root ganglion or distal to it, with the resultant liberation of acetylcholine in the areas affected.

Spasm of small or larger groups of muscle bundles is consequent upon irritation of part—either on the afferent or on the efferent side—of the reflex arc. If the antagonists of the muscles affected are stimulated at the same time pain will develop. I would question whether spasm of muscle *per se* is necessarily associated with pain.

Pain results chiefly through the irritation of pain-carrying fibres in the posterior root filaments and main root, the ganglion, the main spinal root, or of the anterior or posterior primary rami. At the same time peripheral or nearby muscle spasm is produced reflexly. Now a patient who has pain and stiffness in the upper limb tends to move the arm and scapula about. This movement may stretch and tear small groups of muscle bundles and capillaries in the area affected by spasm. Such local trauma together with the mixed vasoconstriction and dilatation with acetylcholine liberation may produce a complex inflammatory response and tender "myalgic spots." These painful spots may themselves each act as a peripheral stimulus in a new reflex arc and produce the reflex spasm of other muscle groups. Hence the process is perpetuated.

Fatty Herniae.—I can only suggest that fatty herniae may occasionally be the result of fatty degeneration of muscles and their fasciae unduly affected locally by excess of acetylcholine liberation and some inflammatory response. But it cannot be due to vagus stimulation, which has other well-known physiological effects—not a feature of the patients under consideration.

Lastly, Sir, better a view which harmonizes with proven first principles than multiple variations on unoriginal themes of Galen's humours and kindred vague "tonics."—I am, etc.,

London, N.4. I. H. MILNER.

REFERENCE

[1] *Opera Omnia II*, quoted by Copeman, W. S. C., *Proc. R. Soc. Med.*, 1947, **40**, 329.

SIR,—Dr. James H. Young (Nov. 6, p. 837) has stated his belief that the existence of fibrositis is "entirely supposititious," has not been proved microscopically, and that it is time the term was buried and forgotten; and other doctors have concurred more or less in his opinion. May I refer all doubters, including Dr. Young and Dr. James Cyriax, to the work on this subject of the late Professor Stockman, of Glasgow University, whose book entitled *Rheumatism and Arthritis* was published in 1920 (W. Green & Son, Edinburgh)? They will there find ample and clear proof of the reality of fibrositis, with photographs of microscopic specimens, of which Professor Stockman made a great number, and much other information. He clearly established the reality of fibrositis, and it is indeed amazing to read some of the letters recently written about it. Is it possible that the writers have never heard of or read Professor Stockman's book?—I am, etc.,

St. Andrews. R. O. ADAMSON.

St. John Ambulance Brigade and Voluntary Action

SIR,—As a postscript to your comments (Oct. 30, p. 792) on Lord Beveridge's book, *Voluntary Action*, may I be allowed to point out what many and varied facilities are offered to those men, women, boys, and girls who feel the urge to use their spare time in helping others? In addition to its better-known services to the sick and injured the old but very active world-wide organization, the St. John Ambulance Brigade, assists in nearly all those spheres of work that you mention—viz., care of the aged, the blind and disabled, and of young children. The organization is not nationalized; it is in fact encouraged to continue on voluntary lines. It is easy to join, and new members are warmly welcomed at any of the many local headquarters. I submit that it would be difficult to find a more satisfying way of exercising that "philanthropic motive" that Lord Beveridge recognizes and advocates than by joining the Brigade.—I am, etc.,

CYRIL PRANCE,
Chairman, Council of the Order of St. John for Devon.

Plymouth.

A Sign of Pregnancy

SIR,—The clinical sign of pregnancy which Dr. J. A. Chalmers describes (Oct. 30, p. 800) corresponds precisely to Piskaček's sign. It was first described by L. Piskaček[1] in 1899, and has been mentioned in various textbooks. A discussion of its significance and of the diagnostic errors to which it may lead will be found in the textbook of Halban and Seitz[2] (vol. 6, p. 980). Dr. Chalmers' independent observations agree with previous reports, and his letter may well revive interest in this sign.—I am, etc.,

London, W.1. ALBERT W. BAUER.

REFERENCES

[1] *Über Ausladungen umschriebener Gebärmutterabschnitte als diagnostisches Zeichen im Anfangsstadium der Schwangerschaft*, 1899, Vienna.
[2] *Biologie und Pathologie des Weibes—ein Handbuch der Frauenheilkunde und Geburtshilfe*, 1924–29, Berlin.

SIR,—Dr. J. A. Chalmers (Oct. 30, p. 800) asks if the eccentric enlargement of the uterus has been described previously. I was taught (by Wilfred Shaw) that this sign was described by Piskaček—that would be some years ago. In Shaw's *Textbook of Midwifery* (London, 1947) a description is given on page 103. It certainly is frequently encountered, and is almost as often diagnosed as a fibroid in the cornu or even as an ectopic by those who have not known Piskaček's sign.—I am, etc.,

London, S.E.18. KEITH VARTAN.

Ruptured Uterus

SIR,—Although I perform the lower-segment operation more frequently than the classical I cannot agree with Mr. C. Scott Russell's statement (Oct. 16, p. 722) that the classical operation is an abomination. It appears to me that the upper-segment operation should be chosen when rapid delivery is indicated. Accordingly it is a suitable procedure (1) when a patient is in a dangerous condition from an excessive loss of blood due to placenta praevia, (2) in cases of accidental haemorrhage which have not responded to less drastic treatment, and (3) in certain cases of acute toxaemia of pregnancy. Loosening of sutures is seldom an important factor in predisposing to rupture in a subsequent pregnancy. I can also assure Mr. C. Scott Russell that rupture through the scar in the lower segment can occur.—I am, etc.,

Bellshill, Lanarkshire. SAMUEL J. CAMERON.

Neonatal Asphyxia

SIR,—Dr. W. N. Leak (Oct. 30, p. 797) has done great service in emphasizing the application of the researches of the late Sir Joseph Barcroft to the problem of neonatal asphyxia. Obstetricians can be divided into three classes by their attitude to this common emergency. The stimulators will apply physical stimulants to the accessible parts of the body and inject pharmacological substances for their action on the respiratory centre. The oxygen enthusiasts will perform all manner of artificial respiration or indulge in the passage of the intratracheal catheter to inflate the lungs with oxygen. The safety-first men will do nothing at all, being too well aware of the danger of each active line of treatment.

While admitting that there may be occasional cases requiring the passage of the intratracheal tube, I am convinced that the best routine measure for infants who fail to respond to the simple clearing of the accessible air passages is the intravenous injection of some respiratory stimulant, and nikethamide (0.5 to 1 ml.) has served very well. The injection may be made into the umbilical vein, and therein lies a hazard for the unwary.

In the normal newborn infant the vein in the cord is distended with blood and may have a diameter of about ½ in. (1.27 cm.), but in a case of white asphyxia the vein is collapsed and may be almost invisible. In these cases the sense of urgency and the phrase "'coramine' into the cord" have on more than one occasion lured the unsuspecting resident into injecting the drug into an umbilical artery, since these are the only vessels visible in the cord. The effects may be disastrous if the injection is large and the 'milking' of the cord vigorous: not only is there no respiratory stimulation but there may develop a thrombosis of some branches of the internal iliac artery. In the observed cases this has usually resulted in a "bruised buttock," but in one infant there was severe paralysis

of most of the muscles of one leg and in another the thrombosis spread to the inferior mesenteric artery, with a fatal issue. It is hoped to publish these cases in due course.

Finally there is the question whether this stimulant treatment might avoid the common neonatal respiratory troubles. Unfortunately this is not so. Intravenous nikethamide has been given at birth to a large series of infants delivered by caesarean section, and the incidence of neonatal death from atelectasis among the more premature babies has not noticeably diminished. It is significant that such an infant will cry vigorously under the influence of the drug, yet at necropsy it may be impossible to demonstrate expansion of the lungs.—I am, etc.,

Birmingham. W. G. MILLS.

H 11 in Malignant Disease

SIR,—I have read with some interest the report of the Medical Research Council on their investigation of H 11 (Oct. 16, p. 701) and the reply by Mr. J. H. Thompson and Dr. G. J. W. Ollerenshaw (Nov. 6, p. 835). I have used H 11 quite extensively in my last surgical practice, and, while having a completely open mind on the subject, I consider the results in many cases were sufficiently surprising to warrant further research and investigation.

Several of my cases were considerably improved for a time, and relief of pain was very noticeable. One case is still alive, and improving, after five years. The improvement in these cases is rather more than a coincidence, particularly as none of these cases was eligible for surgery or radium treatment.

On the other hand I cannot entirely agree with Mr. Thompson's repeated assertion that medical men are prejudiced against H 11, as I found that colleagues in my district were very fair in their attitude, and it was used in many cases by them. While I consider that H 11 in its present form is not the final answer by a long way, I cannot agree that further research on these lines should be summarily dismissed as being of no benefit to humanity.—I am, etc.,

Sheffield. T. SUMMERFIELD KING.

SIR,—Surely some further light could be thrown upon this subject by the application of a little plain common sense as opposed to the complex calculations of the statisticians. I, personally, have never seen a case of *proved* inoperable malignant disease which has recovered. I have never received a first-hand report of such a case from any friend or colleague, yet I feel that if such a case had occurred in one of their patients it would certainly be a subject which they would discuss with others. From my own experience, therefore, I conclude that recovery in such cases is probably excessively rare, though it may occur occasionally.

No fewer than 12 such cases are reported in Mr. J. H. Thompson and Dr. G. J. W. Ollerenshaw's letter (Nov. 6, p. 835). If any one of these cases had been under my care and had recovered spontaneously I would have considered it an extraordinary happening. So I believe would most medical men. That 12 such cases (and, one gathers, even more) should have occurred under a given set of circumstances is stretching coincidence to enormous lengths.

From a common-sense approach I would say that one is forced to choose between alternatives: either the case reports are fictitious or the use of H 11 has actually had a most unusual effect in *some* cases of otherwise hopeless malignant disease. If these claims could be substantiated without any possibility of doubt, then I would say that H 11 at least merits serious investigation. I think this is a matter which should be settled to the satisfaction of all practising doctors, and I for one do not feel completely satisfied with the present position.—I am, etc.,

Ruislip, Middlesex. BRIAN LEES.

Delayed Diagnosis of Phthisis

SIR,—Dr. Peter Stradling (Nov. 6, p. 832) lays just emphasis upon the importance of symptoms in the diagnosis of phthisis. Such a reminder serves to underline the cardinal error of reliance upon physical examination. But Dr. Stradling, it would appear, is now in danger of committing the reciprocal fault of attaching undue significance to the patient's complaints. He quotes Fishberg and Jessell to support his thesis that "there is no active phthisis without constitutional symptoms." This is such a moderate and sensible pronouncement and one which so obviously ought to be justified that it comes as quite a shock to realize that it is not true.

During 1946–7 some scores of naval officers and other ranks who had been *x*-rayed following contact or on discharge from the Service were found to be suffering from acute adult-type tuberculosis. Such experience is of course well known. Many of these men had no symptoms of any kind. Often they protested that the *x*-ray finding must be a mistake. Some had been constantly active and successful in strenuous sport. A young rating who proved to have a large dorsal lobe cavity had reached the final of his unit boxing competition on the day the film was taken.

In assessing their histories allowance was made for the defensive attitude inevitable in young people suddenly plunged into personal disaster by an unsought *x* ray. Questioning therefore was designed to appear casual. Later, when confidence had been established and complete honesty of reply was to be expected, they were invited to think back to their last days of freedom. It often happened that at this stage also not even the most enticing leading question could synthesize a symptom. These patients in fact illustrate the antithesis of Dr. Stradling's dictum that the sufferer from tuberculosis has a history or he would not have sought advice. They did not seek advice because they had no history.

What in fact are these symptoms to which so much attention should be paid? Haemoptysis, ischiorectal abscess, erythema nodosum, continued pyrexia, loss of weight—indeed it would be a bad doctor who did not seek to have a film taken in the presence of such manifestations. But what of "chronic cough," "lassitude," "debility"?—such troubles are the small change of every surgery. Which patient is to take a day off and go ten miles for an *x* ray? The whole background of his consulting room prejudices the general practitioner against the diagnosis of tuberculosis. At a famous chest-hospital the out-patient hall is filled every afternoon with new patients who have brought up blood, recently started coughing, lost stones in weight, or suddenly found their housework beyond them. Most of them prove to have nothing more serious than bronchitis; and these are the few who were selected by their doctors to make the long journey for expert advice. Yet now and again a fit girl coming up as company for a friend is *x*-rayed with the rest and found to have extensive bilateral infiltration.

The conclusion surely is that tuberculosis is a difficult disease. Unwarranted simplification of the problem is not likely to be helpful. Short of *x*-raying the whole population it is obviously an advance to take films of selected groups—perhaps, as an ideal, every medical patient who attends a doctor's surgery. But to become unduly confident that the victim of tuberculosis is likely to have symptoms might prove almost as unfortunate as the old trust in physical signs.—I am, etc.,

Bristol. IAN MCD. G. STEWART.

Respiratory Depression

SIR,—Dr. A. H. Galley (Nov. 13, p. 878) raises again the question of respiratory depression during spinal analgesia. It is accepted that *the* stimulus to respiration is carbon dioxide. Carbon dioxide is formed as a result of metabolism—mainly muscle activity. If muscles are paralysed they no longer form carbon dioxide and the respiration does not receive the stimulus present when the muscles are active. I believe that this is the reason for the respiratory depression in question.

I have had blood CO_2 levels estimated during a few cases; the results bear out the above reasoning, which is also supported by the well-known fact that extremely small doses of thiopentone will produce respiratory arrest during high spinal analgesia. It is further my experience that the inhalation of 5% CO_2 is a valuable respiratory stimulant during spinal analgesia. This reasoning also applies to patients whose muscles have been paralysed by curarization or deep general anaesthesia.—I am, etc.,

Birkenshaw, Yorks. C. G. BLAKELEY.

Breast-feeding

SIR,—In the correspondence on breast-feeding I believe nobody has mentioned the commonest reason for abandoning it at an early stage—that the mother cannot actually see how much the baby is taking. Most babies are overfed for the first fortnight, when the milk comes in, then underfed for a week as the mother starts working, with consequent periods of vomiting, crying, constipation, etc. Thus the milk "doesn't suit the baby" and bottle-feeding is begun.

If mothers could have instruction in and the use of balance scales for even one day a week for the first two months for test feeds and so realize the amount taken—cutting down the time or giving complementing feeds when necessary—I am sure more of them would continue for a longer period.

I entirely agree with Dr. Flora Bridge (Nov. 6, p. 838) that a diminishing supply is increased by returning to three-hourly feeds and especially by expressing the very last remaining drops each time.

I would add that in my own experience to breast-feed completely alone, without the distractions of conversation, noise, and movement, produces a quicker and more even flow of milk and a more contented baby.—I am, etc.,

Mapperley, Notts. PHOEBE CHANCE.

SIR,—I was interested and surprised to read Dr. Rachel Pinney's letter (Nov. 13, p. 878) in which she wrote, "Breast-feeding should be followed by a satisfied sleep together in the warm intimacy seen in animals, instead of the baby being put in a cot." While agreeing that there should be more intimate contact between mother and child in order to stimulate breast-feeding, may I remind Dr. Pinney that the human lactating breast is not similar in shape or position to the lactating breast seen in animals.

If Dr. Pinney allows her breast-fed babies to sleep with their mothers she will see what I have seen and can never forget—the tragic sight of a beautiful ten-days-old baby suffocated to death by the heavy, pendulous lactating breast of its sleeping mother.—I am, etc.,

Herne Bay. G. CATHERINE EVANS.

Pensions for Diabetics

SIR,—In his letter on pensions for diabetes mellitus which has developed during military service Dr. R. D. Lawrence (Nov. 13, p. 875) raises a very interesting and difficult problem. While agreeing that trauma, physical or psychological, cannot itself be a cause of diabetes, all who have seen large numbers of diabetics can quote many cases where there was a remarkable coincidence between trauma and onset of symptoms. As Dr. Lawrence points out, it is impossible to accept the trauma as the sole cause of the disease, since there is no evidence whatever that in either World War the incidence of the disease increased as a result of injury or fear.

The only way in which one can explain these cases is to assume that the disease can be precipitated by trauma in a person already susceptible. That a metabolic abnormality may be present for very many years before development of clinical diabetes is shown by the recent paper of Kriss and Futcher (*J. clin. Endocrinol.*, 1948, **8**, 598) as well as by the fact of a hereditary element in diabetes. Therefore it would seem that a person developing diabetes in the Services when an obviously associated strain or injury is present is entitled to some compensation, since he developed the disease earlier than he would otherwise have done. Unfortunately there is no evidence to show by what length of time development of diabetes may be antedated by trauma, so that assessment of a pension claim cannot be made with any real knowledge of degree of disability.

I should like to raise the question of another possible cause of diabetes in this connexion—viz., carbon monoxide poisoning. It is of course well known that this very often results in hyperglycaemia and glycosuria, but it is claimed that these always disappear within a few days at most. I treated a patient who was one of six poisoned with carbon monoxide in a blast-furnace accident. One died and five were admitted to hospital. All of the latter had glycosuria; four recovered within a few days, but one remained permanently diabetic and required large quantities of insulin. He was about 28 years of age, had no known diabetic relatives, and had previously been in good health, but there was no record of any medical examination before the accident to exclude incipient diabetes. On legal advice no claim for compensation was made, but I should have liked to have heard the case argued in court. If any have records of such cases I should be much interested.—I am, etc.,

Glasgow. JAS. C. EATON.

SIR,—In expressing his opinion on the above subject Dr. R. D. Lawrence (Nov. 13, p. 875) loses sight of the fact that in every ex-Serviceman's appeal for pension for diabetes, as for any other disability, there lie two claims under the royal warrant. These are (1) that the disease was caused by war service, or (2) that it was aggravated or worsened by war service.

While it is accepted medically that only in exceptional circumstances could it not be said that war service was not a factor in the causation of the diabetes, can it be equally accepted that war service might not in some cases have an aggravating influence on the disease in its development and effects? In many cases a considerable time has elapsed in service before the condition has been diagnosed and treated.

The final paragraph in Dr. Lawrence's letter surprises me. I have seen many cases of diabetes in which, and viewed without prejudice, the condition called for both professional and lay sympathy and also for urgent economic support. Nor was there any evidence that adequate treatment and co-operation had not been applied.—I am, etc.,

New Buckenham, Norfolk. R. G. BLAIR.

SIR,—It is somewhat dismaying to attempt to range my pop-gun against the howitzer of so eminent a diabetician as Dr. R. D. Lawrence, particularly when I recall how much I am personally indebted to him for his advice and treatment. Nevertheless this thing has to be done, for by the very eminence of its author any dictum on diabetes may become the foundation of procedure at the Ministry of Pensions boards.

Dr. Lawrence, in "airing his opinion" (Nov. 13, p. 875), states emphatically that war claims for pensions for diabetics are unfounded on fact. He asks, "And, after all, is diabetes a disability worthy of an award, pension, or support?" He quotes the views of the Council of the Diabetic Association, "a sympathetic body of lay diabetics" (incidentally, he is their chairman). This sympathetic body takes the view that adequate treatment and co-operation in it by the diabetic produce "normal health, and no real important disability in work or life." Therefore they refuse to support claims to pensions by diabetics.

One is tempted to ask why, with this happy state of affairs, there is any need for a diabetic association at all, since on Dr. Lawrence's showing it goes out of its way, despite all its "sympathy," to load the dice against the very people in whose interest it was formed. I submit that a diabetic is a sick man, suffering from a grave disease (no insurance company will look at him for a moment—they know a thing or two!), and the suggestion of "normal health—no real important disability" does not bear examination.

I would say that the diabetic is in the priority list for fatigue, anxiety, neuritis, sepsis, gangrene, deep kidney changes, vascular changes, cataract, blindness—a multitude of things. These are the killers. These are the things that enter the mortality lists, and *not* the diabetes.

These are the conditions that are *aggravated* by the hardships and exposures and anxieties of war; so, whether or not worry or hardship *causes* diabetes (and I still believe this to be at issue), the fact remains that the pension boards cannot legally ignore the aggravation factor, which, alas, Dr. Lawrence has done in his letter. In this connexion let us be thankful that Mr. Justice Denning, who can by no means be described as a "sympathetic lay body," has made the meaning and intention of the royal warrant clear to all concerned.—I am, etc.,

London, S.E.12. ERIC COPLANS.

Classical Caesarean Section

SIR,—I read with interest Dr. N. Beattie's letter (Nov. 13, p. 877) in which he appears to advocate the use of spinal analgesia for caesarean section on the grounds that it reduces haemorrhage and encourages "leisurely" operating. There is little doubt that haemorrhage is reduced with this method, but is Dr. Beattie aware that spinal analgesia causes increased power of uterine contractions with the attendant risk of foetal asphyxia, which is of itself a sufficient reason for rapid delivery of the foetus? It is also recognized that these powerful contractions are a direct cause of still-birth if prolonged. The advantage of less haemorrhage under spinal analgesia would therefore seem to be greatly outweighed by the attendant risk of foetal asphyxia and still-birth.

In my somewhat limited experience of caesarean section, routinely performed under minimal ether until the delivery of the foetus and then increasing the depth of anaesthesia to render suturing possible without strain, hurry, or discomfort on the part of the surgeon, the increase in bleeding has been minimal if present, and in no case has there been any sign of foetal asphyxia.—I am, etc.,

Colchester. C. D. SANDERS.

Bovine Tuberculosis

SIR,—Over 15 years ago the People's League of Health estimated in their report that 2,000 deaths in England and Wales, mostly children, occur annually from tuberculosis of bovine origin, and that at least 4,000 fresh cases of this form of tuberculosis develop each year and cause an immense amount of suffering, invalidity, and often permanent deformity. Since that report some effort has been made to eradicate bovine tuberculosis among our cattle herds and so to prevent those thousands of deaths. The Prophit Survey now informs us that some 1,500–2,000 persons still die each year from this form of tuberculosis, while in the U.S.A. eradication of bovine tuberculosis together with the pasteurization of the milk supply has produced an immediate reduction in the number of cases of tuberculosis.

For the tragic state of affairs in this country blame must mainly fall on all our various tuberculosis societies for their failure to inform the public and to keep on telling the public that all these deaths from bovine tuberculosis could be prevented if only we would eradicate bovine tuberculosis among our cattle herds. In addition the whole medical profession should have joined together in demanding that a clean and safe milk supply should be available to everyone. This is urgently needed to-day. From the many years of experience of the American work we now know that eradication of bovine tuberculosis must be completed as quickly as possible, and along with that all milk should be pasteurized.

The Minister of Agriculture has stated that only 16% of our cattle herds are to-day certified free from bovine tuberculosis. This state of affairs must be changed, and immediate steps taken to complete the eradication of bovine tuberculosis within a definite fixed date.—I am, etc.,

Itchingfield, Sussex. S. G. TIPPETT.

Sodium Sulphate for Bleeding Piles

SIR,—I read with great interest an article by Dr. J. C. Lyth (July 13, 1940, p. 53) on the use of the hypertonic property of saturated sodium sulphate solution in inflamed conditions with oedematous reactions, and I should like to record a further case of its successful application.

One of my patients, a nurse, had suffered from bleeding piles "for years." In September, 1945, she had a course of injections, but bleeding continued. In May, 1946, after excessive loss, she was admitted to hospital as an emergency and had further operative treatment. She went home against advice and soon found herself in great difficulty from anal stricture. She could only pass fluid faeces and often passed pus and blood. She felt conscious of a "lump inside" and was sure she had cancer.

In July, 1946, she had further operative treatment and later returned to hospital for help with anal dilatation. Beginning with a No. 8 catheter she took an hour to reach a medium dilator. She had daily losses still of pus and blood, went to stool five or six times a day and as often during the night. She was told nothing more could be done and was deeply distressed.

I had found the application of a pad soaked in concentrated sodium sulphate solution gave relief to pregnant mothers with swollen tender piles. I therefore suggested she tried a continuous wet pack of this. She reported great relief immediately. Encouraged by this I suggested a 2-oz. (57 ml.) enema of saturated solution each night, to be repeated until evacuation had been completed. I thought this would secure her an undisturbed night and might exert a beneficial effect on the "lump," presumably inflammatory, which she felt internal to the anus. Actually, she used two tablespoonfuls to a pint (568 ml.) of water, and injected a pint or more three times during the evening. The bleeding and pain lessened at once, and the resulting comfort made her enthusiastic to persist.

To reduce the labour of this treatment we then tried suppositories of sodium sulphate made by a local chemist—12 gr. (0.8 g.) exsiccated sodium sulphate in cocoa-butter. With care she was able to retain one in the rectum for several hours of the night, and was able to reduce her enemas to one a night She gave up enemas in March, 1947, but continued with the suppositories two or three times a week till June. For two weeks in March, 1947, the severe cold caused the suppositories to crumble. She substituted "anusol" suppositories, but was relieved when she could return to the others.

By September, 1947, she had normal relaxation of the anus. She has had no loss since June, 1947, and has no treatment except for aperients (bowels open nightly with senna). She has been in continuous employment since November, 1946, when she began work again after six months' absence, and is now in excellent health.—I am, etc.,

Oldbury, Worcestershire. BERTHA HENLY.

POINTS FROM LETTERS

Proteins in Nutrition

Dr. E. SAKOSCHANSKY (Southampton) writes: I have read with great interest the article by Dr. D. P. Cuthbertson on the significance of proteins in nutrition (Oct. 23, p. 731). . . . The other point that ought to be more widely known is what Cuthbertson calls "reflex atrophy." After severe injury it seems as if the protein reserves are raided to supply amino-acids or other substances for the reparative process at the site of the injury; and Cuthbertson suggests that the reflex exists in order to render the healing process independent of food supply. . . . If these facts were more widely known much needless anxiety would be removed. Relatives are apt to worry unduly because a sick person does not eat. Often patients with temperatures of 101° F. (38.3° C.) or 102° F. (38.9° C.) are offered heavy food and, what is worse, sometimes force themselves to eat it. This point is by no means trivial. Any busy general practitioner meets with this problem several times a day.

Midwives and Drugs

Dr. A. H. DRIVER (Chesterfield) writes: I notice that in an article on post-partum haemorrhage (Oct. 23, p. 741) Drs. James B. Joyce and G. Gordon Lennon advocate that a midwife inject ergometrine. But in this county this is not included in the list of what a midwife may carry. Is it not time that the rules governing midwives were made less rigid? There appear, too, to be arbitrary differences between counties which might well be made less conflicting.

Fibrositis and the Weather

Dr. A. M. WOOLMAN (Basle, Switzerland) writes: A remarkable feature of the response of the body to weather changes is that it precedes by some hours the actual barometric and other readily observable atmospheric changes. This suggests that the two are not connected as cause and effect but rather that they have a common cause. Squadron Leader A. T. Ryland (Oct. 2, p. 662) rather lightly dismisses electrical causes, pointing out that the potential of the air (meaning presumably the degree of ionization) is very variable and that sudden changes are produced by rain. That this is not the whole story is evident from a consideration of the quality of radio reception, which is undoubtedly dependent upon the electrical state of the atmosphere but is not influenced appreciably by rain. It is, however, affected by changes in solar radiation. Thus it is known that sun spots cause magnetic storms, showers of cosmic rays, and much interference with radio reception. These same sun spots are also associated with bad weather. What influence do the solar radiations have upon the human organism? Is it not conceivable that they are capable of stimulating or disturbing the autonomic functions? As Squadron Leader Ryland has said, "There is an interesting field of research here." Certainly much work has already been done on the subject.

Obituary

LIONEL JAMES PICTON, O.B.E., B.M.

Dr. L. J. Picton, who was well known as a fine type of rural practitioner, died on Nov. 19 at the age of 74. He was a man who brought to his country practice many unusual qualities. He had a critical and cultured mind and a courage in innovation and experiment which would have carried him far in any community, but throughout a long career he remained faithful to the Cheshire countryside. In addition to being a country doctor he was an agriculturist, an expert on soils and foods, and a keenly observant sociologist.

Lionel James Picton was a Cheshire man, and was born at Bebington in 1874. He was educated at the Merchant Taylors' School, Great Crosby, and went on to Merton College, Oxford, taking the M.A., B.M., and B.Ch. degrees in 1901. He began his medical training at Oxford, gaining the Welsh prize for anatomical drawing in 1898. In the same year he went on to St. Bartholomew's Hospital with the senior entrance scholarship, and qualified in medicine in 1900. After a period as house-physician at St. Bartholomew's and a further period as house-surgeon at the Metropolitan Hospital he became house-physician to Liverpool Royal Infirmary in 1903. Eventually he settled in practice at Holmes Chapel, a village of one thousand or so inhabitants. About 1916 Dr. Picton became medical officer of health for the urban district of Winsford and surgeon to the Albert Infirmary there. In his annual reports as medical officer he contrived always to give some unusually interesting information on a variety of subjects. Winsford became a pioneer in certain respects—for example, in its introduction of an antenatal scheme depending on a general practitioner service, a scheme which was later accepted by the county council for general application. In 1914–15 Picton was surgeon and registrar to the Baltic and Corn Exchange Hospital, Calais. His further war service was in his own county, as medical officer in charge of Somerford Park Auxiliary Hospital from 1915, and of Witton Hospital, Northwich, from 1918 until the end of the war. During the recent war he was a member of a medical board at Crewe.

Perhaps his outstanding service to his fellow practitioners was rendered during his long honorary secretaryship of the Cheshire Local Medical and Panel Committee. That committee set an example of enterprise and initiative in many fields, as its motions at successive panel conferences bore witness, and Picton was obviously the driving force in the background. In 1937 the committee presented him with a testimonial in the shape of a cheque for £250 to mark its high esteem and appreciation of "his continued labours on behalf of the dignity and welfare of the medical practitioners of the county." Dr. Picton was in some respects an acute critic of the administration of the National Health Insurance Act. He had many original ideas and was always listened to with respect and attention, though not always followed. At the last panel conference he attended he advocated a scheme for obtaining an increase in the insurance capitation fee by means of bonds redeemable after the war, holding it to be undesirable for various reasons to press for an increase during wartime. He joined the British Medical Association in 1903, and served as representative at several Annual Representative Meetings from 1912 onwards. He had been for a number of years a valued member of the Insurance Acts Committee, and even before that he was a member of the Rural Practitioners' Subcommittee and one of the I.A.C. nominees on the Ministry of Health Distributing Committee. Other Association committee work in which he took part was concerned with arrangements for medical services for the civilian population in wartime, the *National Formulary*, and a general practitioner hospital service. Dr. Picton was a champion of the cottage hospital, and held that for many areas properly equipped cottage hospitals would constitute the organized method of group practice called for in the National Health Service proposals. He was honorary secretary of the Section of Medical Sociology at the meeting of the Association at Oxford in 1936.

Dr. Picton was a great friend of the countryman and delighted in all the habits of the country, including, incidentally, early rising—his surgery opened soon after eight in the morning. He interested himself in such matters as the treatment of soils and the nourishing of crops by suitable manures and the breeding of tubercle-immune cattle. He was a strong advocate of fresh milk. Anything that had to do with nutrition claimed his attention, and he was especially interested in the preparation of wholemeal bread, raw greenstuffs, turnip juice, and other vegetable products. The Cheshire "Medical Testament on Nutrition," published a few years ago, is a monument to his diligence and enthusiasm. Dr. Picton was himself an able writer, fresh and often provocative, though he never published a book. A literary enterprise which owed its inspiration to him was a *Fasciculus Cestriensis* presented in 1934 to another Cheshire medical worthy, his great friend Sir William Hodgson, on his eightieth birthday. It contained contributions from fifty Cheshire doctors and a biography of Hodgson believed to be from Picton's pen. He had interests in many other fields, including Elizabethan literature and microscopical study. He was a member of the Council for Church and Countryside and of the Liverpool Medical Institution, to which he read several papers. He received the O.B.E. in 1920. Picton will long be mourned in Cheshire and by those in a wider circle who knew his quality as a friend, colleague, and critic.

Mr. CYRIL CHARLES HERBERT CUFF, who died in Cyprus on Aug. 17, had a colourful career. After leaving school he went to sea in the Merchant Service, and before the 1914–18 war obtained his master's certificate. At this time he decided to take up medicine and entered the University of Durham, but while still a medical student the war broke out and he joined the R.N.V.R. as sub-lieutenant, and was later promoted lieutenant. During the war he served in the Tyne Defence Trawler Patrol and the Dover Patrol, and later commanded a minesweeper in the Channel area. In 1917, owing to the great shortage of doctors, he was recalled and took his final examinations, graduating M.B., B.S. in 1918. He then joined the R.A.M.C. and was posted to Sierra Leone. After demobilization he obtained the F.R.C.S.Ed., and entered the Colonial Medical Service in 1921. He served first in St. Lucia and then in the Seychelles. In 1926 he was appointed district medical officer in Cyprus, and in 1928 he became surgical specialist in the same territory. In 1929 Mr. Cuff visited Rome, Paris, London, and Manchester to study the treatment of cancer by radium. He retained his interest in this work throughout his life, and published several articles on the results obtained with radium therapy in Cyprus. During the last war he served with Unrra, first commanding a hospital in Palestine and later in Rhodes, but in July, 1946, he was forced to give up this work owing to ill-health and returned to England for treatment. In 1947 he went back to Cyprus, where he practised in a private capacity and also acted as adviser and consultant in radium therapy at the Government Hospital. Mr. Cuff was invested with the O.B.E. in June, 1936. He became president of the Cyprus Branch of the B.M.A. in 1939, and he received the insignia of a serving Brother of the Order of St. John of Jerusalem in April, 1948. He was a versatile man with many hobbies. He was a bold but sound surgeon, with a special leaning towards the surgery of malignant disease. He was a genial and amusing friend, and, although always a hard worker, enjoyed the social side of life and was a most entertaining conversationalist. He was a keen yachtsman and an accomplished pianist. Mr. Cuff was highly thought of in Cyprus, where he accomplished his best work. He leaves a widow and a son.—J. H. B.

Dr. EDWIN VINCENT CANTILLON, who was a member of a well-known Cork family, died on Sept. 11. Dr. Cantillon, a student at Queen's College, Cork, graduated in Dublin in 1900. He had been associated with University College, Cork, from 1907, when he was appointed demonstrator in clinical chemistry; two years later he became demonstrator in materia medica and pharmacy. He was appointed lecturer in therapeutics at the University in 1928, and continued in this position until his retirement on reaching the age limit in 1944. He had also been on the staff of the Erinville Hospital since 1905, and had been associated with the South Infirmary for nearly as long. He was appointed to the Bon Secours Hospital staff in 1916, and he was an examiner for the National University.

Dr. P. J. O'Reilly, Rugby, writes: "Canty," as he was popularly known to us all, was easily the most beloved of all the university medical staff. His acknowledged skill as a physician and lecturer did not prevent him from being the students' friend, especially to those in difficulties. His lectures were

invariably a "full house," and we used to delight in his witticisms and in his ability to debunk sham and hypocrisy. With his going closes a chapter in Irish medicine, for he surely represented the last of the real clinicians. To him many of us owe what skill we possess in the recognition and evaluation of physical signs. Our deepest sympathy goes out to his widow and six sons, four of whom are in the medical profession.

Dr. ANNE FLEMING PERRY PILLANS, who died suddenly on Sept. 24, was well known in medical circles and as a leader in women's affairs in Glasgow. She qualified in 1923, and from the first, as house-surgeon in the Glasgow Royal Infirmary and the Royal Samaritan Hospital for Women, she showed a natural aptitude for the administration of anaesthetics. Deciding on this as a specialty, she undertook a prolonged course of postgraduate study in London, and followed this up with an appointment as resident anaesthetist in Leicester Royal Infirmary, where she remained for two years. Returning to Glasgow, she was appointed visiting anaesthetist to the Victoria Infirmary, the Royal Hospital for Sick Children, the Royal Maternity Hospital, and the Glasgow Dental Hospital, where she added versatility to her other qualities and at the same time built up a private practice. In 1933 she went to Herefordshire, and was appointed visiting anaesthetist to Hereford General Hospital. She also became divisional surgeon to the St. John Ambulance Association and organized and trained one of the nursing divisions in the county. Dr. Pillans returned to Glasgow in 1936, was immediately reappointed to the Victoria Infirmary, and took the diploma in anaesthetics of the Royal College of Surgeons of England. Her hospital appointments entailed the teaching of anaesthetics. Like all good teachers she enjoyed this work, and her lectures were considered outstanding by her students. During the war years she added service in the E.M.S. hospitals and the Glasgow Homoeopathic Hospital to an already busy professional life. As secretary of the Glasgow Women's Southern Medical Society her unbounded enthusiasm and efforts were of great value. As a delegate from this Society to the Standing Conference of Women's Organizations of Glasgow, Dr. Pillans's genius for organization was observed and appreciated, and she was honoured by being elected its president. As a chairman, her ability to handle many varied factions and the resulting difficult situations was quickly recognized. Her services were requested and given in many similar directions. As a speaker she had few equals. The last of her other activities in public affairs was the chairmanship of a committee for Old People's Welfare for a large area of Glasgow. In addition to her medical and social work Dr. Pillans found time to interest herself in art and music, and during her brief holidays was able to indulge her fondness for foreign travel. Her capacity for friendship was as great as her capacity for work. Her humour, her unobtrusive generosity, and her consideration for others were well known. She was greatly loved, and her outstanding personality was much admired.

Dr. DONALD MACKINNON died on Oct. 25 at his home in London after an illness which he bore with cheerful resignation. Born 64 years ago in Glendale, Isle of Skye, he was educated in the village school and in Kingussie Secondary School; he went on to Glasgow University, and in 1910 graduated M.B., Ch.B. He had just started to practise in London when the first world war broke out. He immediately joined the R.A.M.C., and served with distinction in front-line units throughout the whole war in France. When the war ended he resumed his London practice, which rapidly increased from year to year. He held many appointments, among others medical officer to Marylebone Cricket Club and the Central Electricity Board, and surgeon agent to the Admiralty. To his deep sense of duty and his unpretentious and unassuming natural kindness must in great measure be attributed his success in dealing with patients, among whom were persons well known in sport, politics, industry, and journalism. He never forgot the isle of his birth, and year after year he refreshed himself in it; he was the kindest of hosts and helpers to many of its natives exiled in London. He leaves a widow, to whom is extended the deep sympathy of their friends.—N. M. I.

Dr. ALFRED EDWARD HUCKETT, who died at his home in Doncaster on Oct. 31, was 64 years of age. He was born in Madagascar, where his parents were missionaries, and he was brought to this country when he was six. On reaching adult life he started a business career, but his leanings had always been towards medicine, and accordingly he entered Edinburgh University and graduated M.B., Ch.B. in 1909. He was a resident at the Cowgate Dispensary, Edinburgh, and later went to India as a medical missionary. He returned to this country because he was unable to withstand the intense heat and took the post of assistant medical officer at the Gartloch Hospital for Mental Diseases. Dr. Huckett went to Doncaster thirty-five years ago as partner in a large practice and later set up on his own account, being joined by Dr. S. P. Rowlands in 1925. He was very fond of children, and his reputation for maternity work was very high. He had been a member of the Local Panel Committee for Doncaster since its inception, acting for many years as vice-chairman. He was on the West Riding Panel Committee, and last year was made a member of the Insurance Acts Committee, an honour of which he was very proud and which he had richly deserved. He was recently appointed to the local executive committee under the new health scheme. Dr. Huckett was a fine committee man; he was unfailing in his attendances and always had the interests of the medical profession at heart. During the first world war he served from 1914–18 before being invalided out, and he sat on many medical boards during the war that has just passed. He took a keen interest in religious affairs and was a great lover of good music. He was a supporter of the local football club and never missed a home game. Painstaking, courteous, and kindly, he will be missed by a large number of patients and friends. He leaves a widow, one son, and two daughters.—H. F. R.

Dr. FREDERICK HENRY HEALEY died suddenly on Nov. 4 at his home at Hellesdon, Norwich, at the early age of 48. He studied medicine at Birmingham University and graduated M.B., Ch.B. in 1924. He took his D.P.M. in 1927 and proceeded M.D. in 1933. His first appointment in a mental hospital was in 1925 at the County Mental Hospital, Chester. Before being appointed deputy medical superintendent of the Borough Mental Hospital at Derby in 1931 he served for a short time as honorary secretary of the Chester Division of the B.M.A. Between 1933 and 1937 he held appointments in mental hospitals in Essex, Birmingham, and Somerset, and in 1938 he was appointed medical superintendent of the Hellesdon Hospital, Norwich. For ten years he devotedly served the community from which this hospital draws its patients, the boroughs of Norwich, King's Lynn, and Great Yarmouth. Dr. Healey inspired the members of his staff by his own untiring energy and unfailing response to those in need of help, and he kept the hospital abreast of all modern advances in in-patient therapy. It was, however, in his efforts to extend the boundaries of psychiatric treatment beyond the gates of the mental hospital that he spent himself most devotedly. He extended the existing out-patient clinics and founded new ones in the areas which the hospital serves. He was instrumental in founding the Norwich child-guidance clinic. He visited patients in their own homes not only as a consultant but to give subsequent treatment, and he saw many out-patients at the hospital and at his own home. He made it easy for patients to seek early and without apprehension the psychiatric help which they needed. Dr. Healey was a keen reader, and he loved his home and his garden. He was at his happiest in his work and in his united family circle. His colleagues, patients, and friends join his widow, daughter, and two sons in their sorrow and extend to them their deepest sympathy.—C. D. R.

Mr. C. Noon writes: At the time of Dr. Healey's appointment as medical superintendent Hellesdon Hospital was beginning to develop from an asylum to an up-to-date hospital for the treatment of mental and nervous diseases. Dr. Healey carried on and developed this work so that at his death the hospital was fully equipped for the treatment of all types of mental and nervous cases. This is illustrated by the fact that, whereas formerly most cases admitted were certified, at the present time the majority of cases seeking admission are voluntary patients. Dr. Healey was a man of tremendous energy. To keep in touch with his staff he would visit the hospital wards often at seven in the morning in order that he might know the work done by the night as well as the day staff. In his office he worked at tremendous speed. He never wasted either time or words. A visit to his office was of short duration. The business over, the visitor would be launched from the office, but, in spite of the speed at which he worked, his work was in no way hurried and was always thoroughly done. He was a good administrator, but his heart and soul were not in administrative work but in clinical medicine. He was an extremely able psychologist. He believed in the treatment of the individual by the individual, and he inspired his patients with confidence. In dealing with matters which required tact and diplomacy, honesty of purpose was his first principle. His early death, at the age of 48, will cause much sorrow.

Dr. W. H. Carlisle writes: Edward Augustus Bullmore died on Oct. 29 (*Journal*, Nov. 13, p. 881). In addition to general practice he undertook major surgery with great success and was in demand over a wide area as a consultant. Nothing was too much trouble for him to do if it meant that a patient would enjoy a little more relief or an anxious wife or friend a little

lightening of their load. Human motives and reactions were always of great interest to him, and his ability to know what was passing through their minds would often surprise his patients. By this deep understanding he gave great comfort to those in nervous as well as physical ill-health. The late war proved to be a great strain to him, as he continued to work at a pace which many younger men would not have attempted. Finally his health gave rise to anxiety, and he left Wisbech on sick leave to live in his native town of Falmouth while at the same time retaining his interest in the firm of five practitioners which had grown up around him. A protracted illness followed, in which he met a succession of complications with both professional interest and great courage. To the last his brain remained active, and within a few hours of his death he was reminding his physician of a case of mutual interest seen many years before. For forty-two years he helped countless Fenmen through their difficulties, and so he passed on—a great clinician, a trusted friend to many, and a gentleman in the fullest sense of the word.

Dr. A. P. Bertwistle writes: Bullmore was a remarkable man; such was his integrity that he was able to perform the double duty of general practitioner and consultant, a rare achievement. He was head of a firm of four practising at Wisbech, Cambs. Long before the N.H.I. postgraduate scheme he saw to it that he and his colleagues spent so much time each year doing post-graduate work so as to be *au fait* with the latest in medicine and surgery. I met him first at the ill-fated Postgraduate Hostel, with which I was connected, and later formed a high opinion of his powers as a consultant. Though taking meticulous notes and reading widely, he was, unfortunately, never induced to publish a single article. His tastes were of the simplest, yet he enjoyed life to the full. He was one of the busiest of men, but even so he became one of our leading lights in heraldry, and was recently made a Fellow of the Society of Antiquarians of London, of which honour he was very proud.

Mr. Stephen Power, London, W.1, writes: No greater proof could be given of the worth of the late Mr. P. P. Cole than is contained in the testimony of so many colleagues (Nov. 13, p. 880). "His was a mind which penetrated immediately into the essence of a surgical problem." Yes, and into any other problem, too. Whatever the consequence might be, he never hesitated to give his honest opinion in committee or informal discussion. With years of experience behind him there was little in medical matters that he did not fully understand. And his vision for the future was as clear as his understanding of the present. He entertained great plans for a comprehensive medical service for the Merchant Navy. Though he did not live to see them realized, there can be no doubt that some day they will be. It may be that his name will not be connected with their final achievement. Nevertheless his friends will know that the idea first took root in the same brain that seized upon the essential rightness of the filigree method of repairing herniae. We have lost a man whose knowledge and conduct of affairs were as skilful as his operative technique.

Mrs. H. Bessemer, a daughter of the late Sir Bruce Bruce-Porter, writes: Your obituary notice (Oct. 30, p. 802) is not quite correct in one particular—relating to the Bruce-Porter Home of Dr. Barnardo's. This home was given through the generosity of the late Mr. Howard-Williams, who was a personal friend of Sir Bruce, and was named the Bruce-Porter Home in appreciation of the work done by my father in the 1914–18 war.

Medico-Legal

GESTATION PERIOD

In a case heard in the Divorce Court on Nov. 17 the judge accepted expert medical evidence that it was impossible for a normal child to be born after 340 days.[1] This ruling by Mr. Justice Ormerod is the more interesting in view of a case described recently[2] in which the Court of Appeal upheld the decision of Judge Topham sitting as a commissioner of divorce. In this instance the period of gestation of 349 days was accepted by the Court of Appeal on the ground that none of the unusual features of the pregnancy was sufficient to impel the court to reject the medical evidence and infer that adultery had taken place. The previous "record" gestation period was that set up last year of 346 days[3] in the case of *Wood* v. *Wood*.

1 *The Times*, Nov. 18.
2 *British Medical Journal*, Nov. 6, p. 840.
3 1947 2 All E.R. 95.

Medical Notes in Parliament

SHORTAGE OF NURSES

Lord CROOK in the House of Lords on Nov. 9 called attention to the grave shortage of nurses. He said that to a large extent the success of the Health Service would be determined by the number of nurses in employment. Even with 7,000 more nurses employed than a year ago and 31,000 more than in 1938, and also 21,000 student nurses against 43,000 in 1938, yet a huge shortage persisted. There were 33,000 actual vacancies registered at the appointments offices of the Ministry of Labour, and hospital committees estimated the shortage to meet present-day needs to be no less than 50,000. Even if that number of nurses were secured immediately the country would be far short of the number required for essential reforms and to meet the growth of the Health Service. Only 60% of employed nurses worked in institutions nowadays. To-day there were 2,500 school-nurses, or one for every 2,000 children, and Parliament had decided to increase this to one nurse for every 1,000 children. There were now about 6,000 health visitors, of whom 3,600 were employed whole-time; the Royal Sanitary Institute estimated that 8,000 were needed. Nurses were also needed for home nursing, tuberculosis dispensaries, infant-welfare clinics, and factory health services. Until conditions were improved in the worst of the hospitals both nurses and student nurses would continue to leave the nursing service, while on the other hand until the country secured more nurses it would be impossible to improve the conditions against which nurses complained. What was wrong was that the traditional detachment of the nursing service from the life of the community perpetuated a way of life different from everyday existence to-day. Nurses must have the same sense of freedom as shorthand-typists had. The 96-hour fortnight had been applied in the majority of hospitals, but that was achieved by giving the nurse off-duty periods of two or three hours, which in most cases were of no use. He understood that the Ministry of Health was satisfied that a shift system was practicable and had worked out schedules showing how it could be applied in different types of hospitals. He suggested that the Minister of Health should arrange for the setting up of joint-consultative committees of staffs at the earliest possible moment. Only by increasing the number of part-time nurses could they carry out urgent reforms and reduce the present shortage. They must become accustomed to the idea of more male nurses and of more married women.

Wastage During Training

Lord RUSHCLIFFE said the wastage of nurses during training was 50% to 60%. Many of the girls were unfitted from the start and ought never to have entered, but a great number left because they felt they were being frustrated and not being given the chance which they had a right to expect. Wastage would not be checked until responsibility for training nurses was separated from responsibility for providing hospital nursing services, as was done in the training of medical students. The great majority of matrons were deeply anxious to do the best they could for the comfort and happiness of those entrusted to their charge and realized that the modern girl expected more freedom, more time to herself, and less interference with her private life than was the custom a hundred years ago.

Lord SIMON felt that when hospitals were well conducted a probationer obtained from her preliminary nursing work a great deal of training which ultimately made her a skilled nurse.

Lord AMULREE said the chances of quickly overtaking the shortage of 75,000 nurses were not great. The job of the nurse had never been made clear. He suggested that in a certain number of hospitals some wards should become admission wards or investigation wards; in these the patients would have to be looked after by fully trained nurses. Patients approaching convalescence did not need full nursing attention and should be moved to a ward where there would be one or two attendants but not fully trained nurses. Rearrangement of the care of the chronic sick in the large chronic-sick institutions would also free many nurses. By encouraging the medical profession to treat and rehabilitate the chronic sick it would be possible to ensure that more people could be admitted to the beds, and the nurses would not feel distaste at their work, because they would know they were doing some good.

Lord SHEPHERD, replying for the Government, quoted the Red Book as saying that there had been no diminution in the rate of recruitment and that for many years the number of hospital nurses completing training for State registration had shown a steady annual increase. The total nursing staff employed at present amounted to 180,000. Nevertheless, out of 582,000 beds in hospitals 64,000 beds were without nurses.

Unless they could recruit 48,000 women for the nursing profession the granting of shorter hours and many other reforms would be delayed. Only recently new salary scales for student nurses had been adopted. The Red Book was not merely issued for guidance, it represented the policy of the Government, and he hoped that hospital management committees would realize this and would operate its provisions. Separation from the hospitals of responsibility for training nurses was being considered by the Government, which believed that for training there should be some other authority than those who had the management of the hospitals. The numbers of male nurses had increased from 16,000 in 1943 to 24,000 in June, 1948. The Nuffield Provincial Hospital Trust was engaged on an inquiry into the duties of each member of the hospital team the results of which would help in solving staff problems. As had been announced in the King's Speech, a Bill would be introduced this session to change the constitution of the General Nursing Council and to provide for the better training of nurses.

NATIONAL HEALTH SERVICE

Basic Salary

Mr. HASTINGS asked on Nov. 11 whether, in view of the fact that the granting of basic salaries under the National Health Service Act, 1946, was determined to a large extent by doctors who would themselves suffer financially if these were granted, Mr. Bevan would relieve these doctors of their invidious position.

Mr. BEVAN said the doctors themselves had asked for this modification of his original proposal.

Mr. HASTINGS asked whether Mr. Bevan did not think it against public policy to allow people to help in making decisions in which they themselves were financially interested.

Mr. BEVAN replied that the doctors were always able to appeal to him against a decision of the executive council if they felt aggrieved.

Dr. SEGAL then asked whether Mr. Bevan knew that the local executive councils were doing their utmost to dissuade doctors from opting for the basic salary. He asked the Minister to see whether it was possible to create a separate pool.

Mr. BEVAN said he doubted very much whether the executive councils were the people who were trying to dissuade doctors from taking the basic salary. It might be that members of the profession locally attempted to dissuade the doctors. That was a different matter from the executive councils doing it. If a doctor felt aggrieved he could appeal to the Minister, and if the profession desired an alteration in the procedure for which it had asked itself it could similarly appeal to him.

Mr. GALLACHER asked on Nov. 16 why it had been necessary to introduce a form of means test for members of the medical profession when applying to the Glasgow Local Medical Committee for a fixed annual payment.

Mr. WOODBURN'S answer was that the arrangements made for this purpose were made in accordance with the wishes of the medical profession.

Medical Practices Committee

Mr. BEVAN stated on Nov. 15 that the Central Medical Practices Committee was obtaining comprehensive reports on the adequacy of medical services throughout England and Wales. These would be available by Dec. 31. He would carefully consider any recommendations which the committee made to him in the light of these reports.

Medical Supplies for Personal Use

Mr. BEVAN on Nov. 5 declared that he saw no reason to alter the arrangement, which was in force under the old National Health Insurance scheme, whereby medical practitioners in England were granted 2s. 6d. per annum per 100 patients for medical supplies for personal use in their practices but medical practitioners in Scotland were permitted to obtain such supplies without restriction on presentation of their own prescriptions.

Medical Apparatus Causing Electrical Interference

During the second reading debate on the Wireless Telegraphy Bill on Nov. 10 Sir RALPH GLYN said electrical apparatus in hospitals was the cause of more interference than anything else. Most of the big airfields were placed where the approach was over one of the new hospitals which were springing up outside cities. He asked the Minister of Health what he proposed to remedy the risk of interference from this cause. To rectify it would be costly.

Mr. COBB recalled that during the war medical apparatus which was badly needed had to be put out of action for weeks until it was properly screened. Radio-diathermic apparatus had caused serious interference with navigation of aircraft and with radar. Cases had been known of medical apparatus in this country causing interference in America.

Replying for the Government, Mr. HOBSON said medical diathermy was a notorious offender. The Post Office knew the means of overcoming this interference. It could allocate the frequency on which the medical diathermy set should operate and could also screen the apparatus, which was more important. At present the Post Office had no power to do so. Therefore it sought the powers which the Bill contained.

The Bill was read a second time by 256 votes to 96.

Pensions.—Disability pensions for 20% disability and above in respect of war service in 1939–45 which were in payment on July 1, 1948, numbered 346,250.

Nigeria.—Mr. CREECH JONES stated on Nov. 10 that there was in Nigeria one doctor for every 80,000 of the population. Nigerian students were coming to this country in increasing numbers, and there were now over 100 undergoing medical training here. The medical school in Nigeria had trained 50 registered practitioners. Opportunities for training locally would be substantially increased and a much larger output of qualified men would be achieved, now that medical teaching was to be taken over by the University College.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

In a Congregation held on Nov. 13 the degree of M.A. was conferred on B. M. Herbertson, M.B., B.S., University Demonstrator in Pathology, and on Frances C. Naish, M.D., and Lady Whitby, M.R.C.S., L.R.C.P., wife of Sir Lionel Whitby, President of the British Medical Association.

The following degrees were also conferred on Nov. 13:

M.D.—H. W. Balme, J. N. Agate, M. B. Paul, Frances C. Naish.

M.B., B.CHIR.—*W. T. C. Berry, *T. B. Anderson, *F. G. Pattrick, *Phyllis M. Glasspole, *Mrs. Hermione B. Roxburgh, I. K. R. McMillan, Mrs. Ruth M. Lloyd-Thomas, Betty J. Spedding, Ellen M. Bennett, Mrs. Kathryn H. Cohen, Mrs. Brenda M. Eley, Mrs. Margaret H. Whitby.

* By proxy.

UNIVERSITY OF WALES

The following candidates at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

TUBERCULOUS DISEASES DIPLOMA.—M. A. Ali, Q. A. Bari, M. G. Nair.

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council held on Oct. 15 it was announced that Professor J. Chisholm, who has occupied the Chair of Obstetrics and Gynaecology since 1935, had accepted an invitation of the Council to become Director (in a part-time capacity) of the Department of Obstetrics and Gynaecology. He will continue to hold concurrently his post on the staff of the Jessop Hospital.

The Council made the following appointments: William Hobson, M.D., D.P.H., to the newly instituted Chair of Social and Industrial Medicine; Tom Smith, F.R.C.S.Ed., as Lecturer (Temporary) in Obstetrics and Gynaecology; Jeanne Montgomery, M.D., as Assistant to the Medical Officer for the Student Health Service; J. A. Kilpatrick, M.D., M.R.C.P., as Full-time Tutor in Medicine; D. H. Randall, M.R.C.S., L.R.C.P., as Full-time Tutor in Surgery; J. Maclean Smith, M.B., Ch.B., as Tutor in Medical Pathology; J. B. Pyper, M.B., B.Ch., as Demonstrator in Anatomy; and J. K. A. Beverley, M.B., Ch.B., as Honorary Demonstrator in Bacteriology.

The Council received the resignation of Dr. R. T. Gaunt from the post of Demonstrator in the Department of Physiology, and thanked him for his services to the University.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Honorary Fellowship

The Honorary Fellowship of the College has been conferred on Edward Delos Churchill, John Homans Professor of Surgery, Harvard University. The diploma was presented to Professor Churchill by Lord Webb-Johnson, President of the College, after the Buckston Browne Dinner of Fellows and Members on Nov. 11.

At a meeting of the Council of the College, held on Nov. 11, with Lord Webb-Johnson, President, in the chair, the award of a Moynihan Lectureship to Professor Henry Cohen, of Liverpool, was announced. M. L. Crossfill (Epsom College and St. Bartholomew's Hospital) was nominated as the fifty-sixth Jenks Scholar.

The Council received the second report of Sir Hugh Cairns, Arthur Sims Commonwealth Travelling Professor, dealing with his tour of Southern Rhodesia and the Union of South Africa.

The following hospitals were recognized under paragraph 23 of the F.R.C.S regulations: West Bromwich and District General Hospital (Resident Surgical Officer); Leicester Royal Infirmary (additional post of house-surgeon for otolaryngology); Prince Henry's Hospital, Melbourne.

Diplomas

The diploma of M.R.C.S. was granted to the 146 successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Nov. 6 (p. 841) as recipients of the diploma of L.R.C.P.

Diplomas in Medical Radio-Diagnosis, in Medical Radiotherapy, in Physical Medicine, in Ophthalmic Medicine and Surgery, and in Child Health were granted, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN MEDICAL RADIO-DIAGNOSIS.—C. J. Alexander, C. W. P. Bradfield, R. G. Britt, J. H. Ll. Conway-Hughes, A. M. Fraser, P. H. K. Gray, C. H. Kitchen, R. E. Lawrence, R. Levy, R. H. C. Manifold, S. Moor, N. D. W. Morrison, R. Paul, J. McK. Reid, H. L. Ross, M. Spiro, J. L. Steven, B. A. Stoll, D. R. Syred, E. J. S. Townsend, R. F. Williams.

DIPLOMA IN MEDICAL RADIOTHERAPY.—I. G. Brown, H. G. Frank, W. D. Fraser, R. Gibb, P. K. Haldar, Eileen H. Harrison, G. M. Holme, A. E. Jones, A. H. McCallum, J. R. MacLeod, R. D. Nash, U. S. Prasad, T. M. Prossor, W. M. Ross, N. B. Roy.

DIPLOMA IN PHYSICAL MEDICINE.—G. H. Dobney, D. M. L. Doran, Joan M. Gold, G. Gregg, J. B. M. Milne, K. W. N. Palmer, J. D. Thompson, M. E. Wigfield, R. W. Windle.

OPHTHALMIC MEDICINE AND SURGERY.—J. S. McKenty.

CHILD HEALTH.—M. F. Moses.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College held on Nov. 2, with Dr. W. D. D. Small, President, in the chair, the following were elected to the Fellowship: G. A. H. Gumley (Dunfermline), S. Thiambiah (Vepery, Madras), E. Bulmer (Birmingham), J. D. Ross (Kingskettle), A. W. Branwood (Edinburgh), H. J. S. Matthew (Edinburgh).

The diploma of Membership was conferred upon the following: L. M. Comissiong (Grenada), E. G. L. Mark (Macclesfield), G. A. Rail (East London), T. G. Wilson (Berwick-upon-Tweed), H. C. Falcke (Vereeniging), I. Kessel (Johannesburg), W. R. Lang (Auckland, N.Z.), C. C. Foote (Westport, N.Z.), S. Lopis (Johannesburg), W. A. B. Campbell (Belfast), J. W. Nelson (N. Rhodesia), M. S. Fraser (Edinburgh), A. F. J. Maloney (Edinburgh), E. N. Moyes (Edinburgh), Joan E. Spicer (Edinburgh), J. D. T. Steele (Portobello), J. C. Mehta (Agra, India), A. T. Macqueen (Edinburgh), W. M. M. Lyon (Edinburgh), P. B. Fox (London), J. S. Robson (Edinburgh), Mary K. MacDonald (Edinburgh), J. A. Loraine (Edinburgh), W. A. Karunaratne (Ceylon).

The Hill Pattison-Struthers Bursary in Clinical Medicine was awarded to David Bull, L.R.C.P.Ed., and the Hill Pattison-Struthers Bursaries in Anatomy and Physiology to M. A. Abdulla and I. I. M. MacGregor.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At the annual meeting of the College held on Oct. 27 the following officers were elected for the ensuing year: *Presiaent*, Mr. Frank E. Jardine; *Vice-president*, Mr. James M. Graham; *Secretary and Treasurer*, Mr. K. Paterson Brown; *Representative on General Medical Council*, Sir Henry Wade; *Conservator of Museum*, Mr. J. N. J. Hartley; *Convener of Museum Committee*, Mr. W. Quarry Wood; *Librarian*, Dr. Douglas Guthrie.

The following candidates, having passed the requisite examinations, were admitted Fellows: A. Adam, G. Y. Akrawi, J. L. Anderson, J. H. H. Balmer, N. C. Banerjee, A. Beiles, S. Bender, J. A. Bentham, T. A. Berry, K. G. Bhate, J. G. Bickerton, O. M. Brewster, D. T. A. Brown, J. C. McC. Browne, P. L. Brunnen, S. Burke, A. E. Burton, R. W. Busschau, T. S. Chalmers, H. S. Chaudhuri, K. C. Chopra, Daphne W. C. Chun, G. L. Clark, H. Colman, P. U. Creighton, K. T. Dholakia, W. A. J. Donald, J. W. Eadie, C. O. Easmon, A. F. A. Fattah, R. J. A. Fraser, J. R. Frylinck, Y. L. Ganjawala, C. C. Gardner, S. P. Ghosh, I. E. W. Gilmour, M. A. Goodwin, D. F. de S. Goonawardena, A. Gonski, W. Gordon, A. A. Haig, R. L. Hartley, F. J. Hedden, O. K. Hjertaas, A. R. Hodgson, J. M. Hoffman, D. W. Huish, Margaret A. Ingram, F. L. F. Innes, L. A. Jacobs, H. V. Jones, J. D. Joubert, C. V. Jumeaux, R. M. Kamdar, S. K. Kay, H. H. Kennedy, H. I. Le Brun, R. B. Lynn, G. S. D. Mahapatra, C. B. R. Mann, W. B. Martin, A. Mathan, N. D. Matson, G. E. Mavor, K. M. Mehta, B. F. Miller, R. J. V. Milner, G. P. Mitchell, P. Moore (Mao Wen-Chee), S. Morgan, E. Morrison, E. L. F. McConnachie, A. MacKellar, R. G. MacLeod, R. A. M. McVicker, J. D. O'Flynn, W. J. O. Page, A. T. S. Paul, A. M. Porter, H. Proctor, A. Raxlen, F. Riggall, E. L. S. Robertson, A. P. Sandrasagra, P. P. H. Schmidt, N. C. Scott, El S. A. K. H. A. Shabanah, W. Sillar, A. Sinnatamby, E. W. O. Skinner, A. Skowron, H. A. Smith, W. F. Smyth, R. Spencer, H. M. Stevenson, W. B. Stirling, B. S. Surti, G. Sutherland, J. W. Sutherland, K. G. Symonds, L. R. Taylor, M. N. Teubes, Ll. W. Warcup, C. C. Wark, S. R. Wassef, A. Webb-Jones, W. F. White, A. E. Wilkinson, D. G. Wright, S. P. Wrightson.

No. 45

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Nov. 6.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1948 (a)	(b)	(c)	(d)	(e)	1947 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	21	4	14	2	2	39	3	23	2	—
Deaths		2	—				1	1		
Diphtheria	171	17	54	9	4	219	21	55	24	6
Deaths	1	—	—	—	—	5	1	2	—	—
Dysentery	55	7	59	—	2	105	4	21	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	—	—	—	—	—	1	—	1	—	—
Deaths		—					1			
Erysipelas			39	13	4			41	8	4
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				60					68	
Deaths	34	6	—	4	2	61	3	22	17	4
Measles*	6,177	123	166	124	75	2,179	72	191	205	7
Deaths†			—	—	1	1	—	1	1	—
Ophthalmia neonatorum	42	5	9	—	1	54	3	9	—	—
Deaths										
Paratyphoid fever	3	1	6 (B)	—	—	6	2	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	496	30	8	2	6	571	44	3	2	1
Deaths (from influenza)‡	4	1	1	—	1	14	2	—	2	—
Pneumonia, primary			187	20				305	23	
Deaths	208	32		5	8		43		8	10
Polio-encephalitis, acute	2	—				12	1			
Deaths							—			
Poliomyelitis, acute	73	6	4	1	—	198	16	39	12	7
Deaths§	4	2					1			
Puerperal fever		—	14		—		1	20		—
Deaths										
Puerperal pyrexia‖	106	12	3	—	2	107	8	9	1	1
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,471	91	314	206	35	1,730	116	296	57	63
Deaths†			—	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	4	—	—	2	2	9	2	—	4	—
Deaths	—	—	—	—	—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	2,240	111	89	72	10	1,072	73	46	30	3
Deaths	5	1	—	2	—	1	1	—	—	—
Deaths (0–1 year)	293	42	43	18	13	321	40	52	33	15
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,771	811	618	185	109	4,569	771	618	170	126
Annual death rate (per 1,000 persons living)			12·5	11·6				12·8	10·7	
Live births	7,501	1274	875	396	227	7,869	1292	924	401	240
Annual rate per 1,000 persons living			17·7	24·8				18·6	25·3	
Stillbirths	169	23	22			186	29	24		
Rate per 1,000 total births (including stillborn)			25					25		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis in New Zealand

The report of an investigation into the outbreak of poliomyelitis in Auckland is included in the annual report for 1948 of the Department of Health for New Zealand. Between November, 1946, and March, 1947, the diagnosis in 141 cases was confirmed, which is equivalent to an attack rate of 406 per million. The spread of infection followed the usual pattern of scattered cases with no apparent connexion between successive cases. There was a long interval of nearly two months before a case was notified from the North Shore, though by this time 50 cases had been reported on the city side. The outbreak of poliomyelitis was preceded and accompanied by a large number of cases of minor sickness (vomiting, diarrhoea, sore throat, and fever). The conditions prevailing at the time of the outbreak were investigated by visiting the homes of all cases occurring in the metropolitan area and inquiring into the recent health of the patient and the symptoms of attack, and into the health of all other members of the household. House-to-house visits were made in the area surrounding the first confirmed cases, and for controls a similar type of area, containing about twenty houses, was selected on the North Shore. There appears to have been an association between the large outbreak of minor sickness and the outbreak of poliomyelitis; a very large proportion of the household contacts of confirmed cases of poliomyelitis had an attack of the minor sickness during the period of observation.

The conclusion the investigator arrived at was that the spread of poliomyelitis was not likely to be due to droplet infection but rather to faecal organisms. It is suggested that indoor dust-borne infection, at school and in the home, may play an important part in propagating the disease and that the results of recent research into threadworm infestation may throw light on this factor.

Discussion of Table

In *England and Wales* an increase occurred in the notifications of whooping-cough 180, scarlet fever 97, acute pneumonia 78, and diphtheria 42; decreases were recorded for measles 34 and dysentery 13.

Small rises in the notifications of whooping-cough occurred in all regions except Wales; the largest increase was Lancashire 47. The only local variation of any size in the incidence of scarlet fever was a rise of 44 in Warwickshire.

The rise in the notifications of diphtheria was mainly contributed by four areas. An outbreak of diphtheria affecting 8 persons was notified from Hertfordshire, St. Albans R.D. The increase of 9 reported in Staffordshire resulted from sporadic cases throughout the county. The other two areas with a relatively large rise in the incidence of diphtheria were Warwickshire, Birmingham C.B., where the cases rose from 7 to 14, and Sussex, Brighton C.B., with an increase from 4 to 11.

The largest decreases in the notifications of measles were Yorkshire East Riding 85, Monmouthshire 79, Derbyshire 58, and Shropshire 56, while the largest increases were Lincolnshire 150 and Gloucestershire 80. Of the 247 cases of measles in Lincolnshire, 123 were notified in Grimsby C.B., 54 in Barton-upon-Humber U.D., and 43 in Glanford Brigg R.D. In Gloucestershire 256 of the 286 cases of measles were notified in Bristol C.B.

The only large centre of dysentery was Lancashire, where 21 cases were notified. The largest returns of acute poliomyelitis were Yorkshire West Riding 10 (Barnsley C.B. 3 and Leeds C.B. 3); Northamptonshire 5 (Kettering M.B. 4); and London 6.

In *Scotland* the only variations in the incidence of infectious diseases were increases in the notifications of measles 119, acute primary pneumonia 34, and whooping-cough 14. In the county of Aberdeen 5 cases of dysentery were notified, and in the city of Aberdeen 6 cases of paratyphoid fever.

In *Eire* the only change in the trends of infectious diseases was an increase of 37 in the notifications of scarlet fever. A small rise in the disease was general throughout the country.

In *Northern Ireland* the notifications of measles in Belfast C.B. increased by 18, while the notifications of scarlet fever in this city fell by 14.

Week Ending November 13

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,450, whooping-cough 2,481, diphtheria 159, measles 6,910, acute pneumonia 579, cerebrospinal fever 33, acute poliomyelitis 60, dysentery 133, paratyphoid 8, and typhoid 5.

Medical News

London Medical Exhibition

The London Medical Exhibition, the thirty-first of its series, was held in the hall of the Royal Horticultural Society, Westminster, last week, and brought together a very full display of recently developed products offered by manufacturers to the medical profession. The exhibitors at 170 stands included all the well-known firms, and many not so well known. In walking along the aisles of the exhibition the visitor was not aware of shortages, though behind their very attractive fronts—and more skill was shown in the art of presentation than ever—the manufacturing houses may be grappling with many difficulties. The stands of eight medical publishing firms were a pleasant feature of the exhibition.

World Federation for Mental Health

The World Federation for Mental Health, formed at the time of the International Congress in London last August, has now been officially recognized for consultative purposes by WHO and Unesco. Dr. J. R. Rees, the president of the World Federation, has expressed the hope that this consultative arrangement will lead to a further recognition of the importance of mental health in efforts to establish a healthier and happier world society. The Federation is being represented by Dr. M. K. el Kholy, of Egypt, at the General Conference of Unesco which opened at Beirut on Nov. 17. The World Federation already comprises 21 mental health associations of different nations, and others are expected to be admitted to membership in the near future. Dr. André Repond, of Switzerland, now vice-president, will succeed Dr. Rees as president next year. Professor H. C. Rümke, of Holland, is chairman of the Executive Board, which will meet in Amsterdam in January. Arrangements are also now being made for the Assembly of the World Federation to be held in Geneva next August, when delegates from all over the world will be present.

National Health Scheme in Northern Ireland

There are 730 doctors on the medical list of the Northern Ireland General Health Services Board, states the Northern Ireland Government Office. Over 90% of the total population of Northern Ireland have registered with general practitioners under the scheme. Very few dentists are outside the scheme, 258 being in contract with the Board for the provision of general dental services. The calls made by the public upon the dental service have been greater than was expected, and up to the end of October 55,516 persons have had treatment completed.

Therapeutic Substances Regulations

Penicillin is defined in the Therapeutic Substances Amendment Regulations, 1948, as "any antimicrobial acid which (*a*) may be shown on chemical and physical examination to contain in its structure a fused thiazolidine beta-lactam nucleus; or (*b*) loses its antimicrobial activity on hydrolysis by the penicillinases which destroy the antimicrobial activity of the substance known as International Standard Penicillin, and accordingly may, without chemical and physical examination, be presumed to contain in its structure such a nucleus as aforesaid; and includes any salt or derivative obtained from any such acid and any solution containing any such acid or salt or derivative." The regulations also contain provisions about diphtheria prophylactic, and anti-toxins and anti-sera. They come into effect on Dec. 1 and amend the Therapeutic Substances Regulations, 1931, and subsequent regulations.

Dr. J. Trueta

Dr. J. Trueta has already received the honorary degree of D.Sc. from Oxford and is an honorary Fellow of the Royal Canadian College of Surgeons. On Nov. 10 he was awarded the Prix Labourie by the Académie de Chirurgie in Paris for his contribution to the progress of surgery. The President of the French Academy of Surgery presented the medal to him in the presence of a crowded assembly which included some of the most outstanding surgeons of France, among them Professor René Leriche, Professor Bazy, and Professor Merle d'Aubinye. Dr. Trueta later addressed the Assembly on the renal circulation and its pathology, with particular reference to the research which he and his colleagues have carried out at the Nuffield Institute in Oxford.

Wills

Major-General Sir Thomas Henry Symons, late Director-General, Indian Medical Service, left £4,818. Dr. Edwin Allan Thomas Green, of Longsight, Manchester, left £15,079; Dr. Charles Matheson Kennedy, of Plymouth, £14,081; and Dr. Harry David Wyse, formerly honorary anaesthetist, Royal Salop Infirmary, Shrewsbury, £5,143.

COMING EVENTS

Harben Lectures

Sir Lionel Whitby, C.V.O., M.D., F.R.C.P., Regius Professor of Physic in the University of Cambridge and President of the British Medical Association, will deliver the Harben Lectures, on "Haemopoiesis," at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W., on Tuesday, Wednesday, and Thursday, Dec. 7, 8, and 9, at 3 p.m. Admission is free, without ticket, but those who wish to attend the lectures should notify the secretary of the institute at the above address.

Purvis Oration

Sir Howard Florey, F.R.S., will deliver the Purvis Oration before the West Kent Medico-Chirurgical Society at Miller Hospital, Greenwich High Road, London, S.E., on Friday, Dec. 10, at 8.30 p.m. His subject is "New Chemotherapeutic Substances of Microbial Origin."

American Group Therapy Association

The Sixth Annual Conference of the American Group Therapy Association will be held in the Einhorn Auditorium of the Lenox Hill Hospital, 76th Street and Park Avenue, New York City, on Jan. 21 and 22, 1949. There will be papers and discussions on different aspects of group psychotherapy. Information may be obtained from the association at 228, East 19th Street, New York 3, New York.

Medical Golf

The annual general meeting of the Medical Golfing Society is being held on Dec. 9 at the Mayfair Hotel; the annual dinner follows.

SOCIETIES AND LECTURES

Friday

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, London, W.—Nov. 26, 8 p.m. Discussion: "*The Teaching of the Venereal Diseases.*" To be opened by Dr. Robert Lees.

Saturday

CHARTERED SOCIETY OF PHYSIOTHERAPISTS: SOUTH HANTS AND DORSET BRANCH.—At Boscombe Hospital, Nov. 27, 3 p.m. A new C.O.I. film (60 mins.): "*Poliomyelitis—Diagnosis and Management.*" All members of the medical profession are invited.

Tuesday

BRITISH ASSOCIATION OF PHYSICAL MEDICINE.—At Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C., Nov. 30, 5.30 p.m. "*Domiciliary Psychotherapy,*" discussion to be opened by Lord Horder, Dr. Francis Bach, and Dr. F. S. Cooksey.

GLASGOW UNIVERSITY.—Nov. 30, 4.30 p.m. "*The Pursuit of the Infinitely Small (History of the Microscope),*" by Dr. Douglas Guthrie.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—Nov. 30, 5 p.m. "*Histopathology of the Skin,*" by Dr. I. Muende.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., Nov. 30, 11 a.m., "*Syphilis in Pregnancy,*" by Dr. W. N. Mascall; at St. Peter's Hospital, Henrietta Street, London, W.C., Nov. 30, 5 p.m., "*Hydatid Disease and Bilharzia of the Urinary Tract,*" by Mr. R. Ogier Ward.

Wednesday

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., Dec. 1, 11 a.m., "*Congenital Syphilis,*" by Dr. W. N. Mascall; 5 p.m., "*Stricture of the Urethra,*" by Mr. J. E. Semple.

SOCIETY OF PUBLIC ANALYSTS.—At Institution of Civil Engineers, Great George Street, Westminster, S.W., Dec. 1, 7 p.m. Joint meeting with the Food Group of the Society of Chemical Industry. Discussion: "*Food Standards and Labelling.*"

UNIVERSITY COLLEGE, Gower Street, London, W.C.—At Physiology Theatre, Dec. 1, 5.15 p.m. "*Statistics from the Standpoint of a Pharmacologist,*" by Dr. J. W. Trevan, F.R.S.

Thursday

CHADWICK TRUST.—At St. Mary's Hospital Medical School, Paddington, London, W., Dec. 2, 4.30 p.m. "*Preventive Medicine and Clinical Medicine in Relation to Public Health,*" Malcolm Morris Memorial Lecture by Dr. C. P. Seeley.

FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, Dec. 2, 5 p.m. "*Lac Caninum,*" by Dr. D. M. Foubister.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—Dec. 2, 5 p.m. "*Scleroderma,*" by Dr. G. B. Dowling.

INSTITUTE OF LARYNGOLOGY AND OTTOLOGY, 330–2, Gray's Inn Road, London, W.C.—Dec. 2, 4.15 p.m. "*The Treatment of Acute Otitis Media,*" by Mr. G. Ewart Martin.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., Dec. 2, 11 a.m., "*Serological Tests for the Diagnosis of Syphilis,*" by Dr. R. Thomson; at St. Peter's Hospital, Henrietta Street, London, W.C., Dec. 2, 5 p.m., "*Gonococcal Urethritis,*" by Dr. A. H. Harkness.

ROYAL PHOTOGRAPHIC SOCIETY: MEDICAL GROUP, 16, Prince's Gate, London, S.W.—Dec. 2, 7 p.m. "*Medical Photography and the Publisher,*" by Mr. R. F. West (publisher's viewpoint) and Mr. C. C. Redman (process-worker's viewpoint).

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—Dec. 2, 4.30 p.m "*Neurology and Psychiatry.*" Lecture-demonstration by Dr. Anthony Feiling.

Friday

CAMBRIDGE UNIVERSITY: PHYSIOLOGICAL LABORATORY.—Dec. 3, 5 p.m "*Cerebral Compression in Man,*" by Professor Geoffrey Jefferson, F.R.S

EDINBURGH CLINICAL CLUB.—Dec. 3. Dance.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, London, S.E.—Dec. 3, 4.30 p.m. "*Hare-lip and Cleft Palate,*" Thomas Percy Legg Memorial Lecture by Mr. Denis Browne.

LONDON CHEST HOSPITAL, Victoria Park, E.—Dec 3, 5 p.m. "*Anaesthesia for Thoracotomy,*" by Dr. R. A. Beaver.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, Keppel Street, W.C., Dec. 3, 5.15 p.m., "*The Pharmecology of Homologous Series.*" Special University Lecture by Dr. H. R. Ing, D.Phil.

MAIDA VALE HOSPITAL MEDICAL SCHOOL, Maida Vale, London, W.—Dec. 3, 5 p.m. Case demonstration by Dr. H. E. Dimsdale.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—Dec. 3, 8 p.m. "*Hypertension.*" Symposium.

SURREY COUNTY MEDICAL SOCIETY.—At Kingston County Hospital, Dec. 3, 6.30 p.m. Annual general meeting with film show of medical films.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—At Whipps Cross Hospital, London, E., Dec. 3, 8.30 p.m. "*Too Many Words,*" by Dr. T. F. Fox.

Saturday

BIOCHEMICAL SOCIETY.—At Middlesex Hospital Medical School, London, W., Dec. 4, 11 a.m., 271st meeting. Papers will be read.

APPOINTMENTS

The Secretary of State for Scotland has appointed Mr. E. A. Hogan, an Assistant Secretary in the Department of Health for Scotland, to be Registrar General of Births, Deaths, and Marriages in Scotland, in succession to Mr. J. G. Kyd.

Mr. Hogan entered the Civil Service in 1913 and became closely associated with the initiation and administration of the Contributory Pensions Scheme. On the outbreak of the second world war he was attached to the Department's London Office and was made an Assistant Secretary in 1940.

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—The following appointments at the hospitals indicated in parentheses are announced: *Physician Superintendent*, C. R. Birnie, M.D., M.R.C.P., D.P.M. (St. Bernard's); *Physician*, T. A. W. Edwards, M.B., B.Ch., M.R.C.P. (Clare Hall); *Radiologist*, F. M. Abeles, M.D., F.F.R., D.M.R. (West Middlesex).

STOTT, C. F., M.B., Ch.B., Assistant Medical Officer of Health, Stoke Newington, London, N.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Hadley.—On Nov. 16, 1948, at Middlesex Hospital, London, W., to Jean (née Stewart), wife of G. D. Hadley, M.D., F.R.C.P., a daughter.

Nicholson.—On Nov. 15, 1948, at Louth and District Hospital, to Margaret, wife of Neville J. Nicholson, M.B., F.R.C.S.Ed., a daughter.

Robertson Smith.—On Nov. 15, 1948, to Marjorie (née Wight), wife of David Robertson Smith, M.B., B.Ch., a son.

DEATHS

Blackley.—Recently, Frederick John Blackley, M.D., of Maplewood, Heatherlands Road, Upper Bassett, Southampton.

Blakey.—On Nov. 15, 1948, at Cedars Crescent, Sunderland, Alexander Blakey, M.B., Ch.B. aged 59.

Cross.—On Nov. 17, 1948, at Eynesbury, St. Neots, Hunts, Edward John Cross, T.D., M.D., D.P.H., aged 83

Hutchinson.—On Nov. 12, 1948, at 18, Woodland Road, Littlehampton, Robert Hilton Hutchinson, M.R.C.S., L.R.C.P

McDonald.—On Nov. 15, 1948, at 8, Blantyre Terrace, Edinburgh, Stuart McDonald, M.D., F.R.C.P.Ed., F.R.S.Ed., Emeritus Professor of Pathology, University of Durham.

McGillivray.—On Nov. 12, 1948, in a Dundee nursing-home, May Alexandra McGillivray, M.B., Ch.B.

Merrick.—On Nov. 10, 1948, at Croydon, Robert Warren Merrick, M.D., aged 83

O'Connor.—On Nov. 11, 1948, at Sheffield, Michael Joseph O'Connor, M.B., B.Ch

Robertson.—On Nov. 9, 1948, at 15, Zulla Road, Mapperley Park, Nottingham, John William Robertson, O.B.E., F.R.C.S.Ed., aged 65.

Simpson.—On Nov. 16, 1948, at Edinburgh, James Bertie Simpson, C.B.E., T.D., M.D., F.R.C.P.Ed., of 9, Nile Grove, Edinburgh.

Tocher.—On Nov. 12, 1948, at Jock's Lodge, Arbroath, Angus, James Williamson Tocher, M.C., M.B., Ch.B., D.P.H., aged 64.

Vincent.—On Nov. 12, 1948, at The Gardens, Broadfields, Reigate Road, Reigate, Surrey, Herbert Edmund Vincent, M.D., aged 84.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Vaginal Tampons

Q.—*Is medical opinion opposed to the general use of tampons and, if so, why? Where can information on this subject be obtained?*

A.—Opinion is not unanimous, but most gynaecologists consider that the regular and routine use of vaginal tampons during menstruation is undesirable. The reasons for this are: (1) Unless the tampons are changed frequently some degree of infection in the vagina is almost inevitable; (2) the presence of prolonged mild infection, and possibly the mechanical irritation of the pack, may favour the development of erosion and other lesions of the cervix; (3) in unmarried girls the practice of intravaginal manipulation may have unfavourable reactions and encourage masturbation; (4) there is a real danger that the tampon may be forgotten and allowed to remain in the vagina for days or weeks at a time; serious intrapelvic infection may then ensue. The removal of stinking tampons which, without the woman's knowledge, have remained in the vagina for long periods of time is by no means uncommon in a gynaecological out-patient department. Provided care is taken, there seems to be no reason why an intelligent woman should not use a tampon for a few hours on special occasions; the danger lies in constant and regular use of these appliances. These points are dealt with in most of the modern books on female sex hygiene written for the laity, but we do not know of any detailed scientific dissertation on the subject.

Treatment of Squint

Q.—*What is the right age to operate for squint? I have heard it suggested that operation is not advisable before 15 or 16 years of age. My own belief is that a pronounced squint has a grave psychological effect on the child, who feels ugly and therefore inferior and may react aggressively to this situation. Can operation be undertaken effectively before school age?*

A.—It is now generally agreed that it is advisable to rectify squint before, or early in, school life. The present early treatment of squint consists of orthoptic exercises in addition to the correction of any refractive error. These orthoptic exercises can be given from the age of 3 or 4, and many squinting children obtain full binocular vision without operation. If such exercises do not rectify the squint it is advisable to operate before the child goes to school. The disadvantage of having to use a general anaesthetic is fully compensated by the fact that the child does not experience at school the difficulties pointed out in the question. The older view that operation should not be undertaken until the child has reached the age of 12 years or so has proved fallacious.

Intravenous Anaesthesia in Dentistry

Q.—*Is the intravenous use of soluble thiopentone or hexobarbitone considered good practice for dental anaesthesia in suitable cases? What are the main contraindications? Can you recommend an authoritative textbook on this subject?*

A.—Intravenous anaesthesia alone, for extraction of teeth, is satisfactory when the operation is short and the drug is administered in such a manner that the patient returns to full consciousness immediately after the extraction. This is ensured by the rather rapid injection of a small dose (say 0.25 g.) in a fit adult. Adequate anaesthesia for only a minute or two is obtained, with a rapid and complete recovery. A mouth pack or a curtain of gauze across the pharynx should never be omitted, to stop flying teeth entering the larynx. Intravenous anaesthesia for longer dental procedures should be used only by experienced anaesthetists who have the means and ability to keep the pharynx clear of blood and debris without obstructing respiration. Even with these precautions the method is probably more hazardous for long operations than endotracheal anaesthesia. Intravenous anaesthetics find their best use in chair dentistry as a preliminary to nasal nitrous oxide, particularly when the patient is known to be resistant to the latter. A small dose of 0.1 to 0.2 g., by itself barely enough for unconsciousness, will make the immediately following nasal nitrous oxide anaesthesia easy and successful.

The main contraindication to the use of thiopentone or hexobarbitone as the sole anaesthetic for dental cases is a long operation. It should not, in addition, be used in chair cases except for the robust, for fear of untoward effects which may follow the temporary fall of blood pressure in the sitting position. The possibility of a "hangover" after even small doses of intravenous anaesthetics rules this method out, too, when the patient has to return home alone shortly after the extraction. These matters are dealt with at length in *Essentials of General Anaesthesia*, by R. R. Macintosh and Freda Bannister (Oxford, 1947, 4th edition).

Flavines and C.T.A.B.

Q.—*Which of the flavine-type antiseptics do you recommend for local use—in solution or as a powder, plus a sulphonamide? Could you also tell me the strength of cetyltrimethylammonium bromide (C.T.A.B.) for local use, and whether this may be combined with a flavine derivative?*

A.—Acriflavine has been generally abandoned on account of its inconstant composition, high toxicity, and excessive solubility, and proflavine sulphate because its solution is highly acid. Either proflavine hemisulphate or 5-aminoacridine hydrochloride should be used. It is usual to mix 1 part of the former with 99 parts of sulphathiazole to obtain a powder for application to wounds, etc.

C.T.A.B. is generally used as a 1% solution. It is not incompatible with flavines, but should nevertheless not be "combined" with them in the sense of including both in the same solution. It is more rational to use C.T.A.B. as an initial cleansing agent with some quick disinfectant action and to follow this by the application of a flavine–sulphonamide powder to secure a more lasting antiseptic effect.

Risk of Congenital Syphilis

Q.—*A patient aged 60 suffering from carcinoma of the stomach had a positive Wassermann reaction shortly before his death. No history of infection could be obtained. His wife died of lobar pneumonia at the age of 45. He has two sons aged 20 and 25, who show no signs or symptoms of congenital syphilis and are Wassermann-negative. Is it possible for a congenital syphilitic to remain symptom-free and show no serological sign of the disease to the age of 25? Need any further precautions be taken to make certain the sons have not been infected? The elder is being married shortly.*

A.—The fact that the father's Wassermann reaction was positive at about the age of 60 does not prove he had syphilis; even if he had he may have passed the infective stage before he married. Presumably there was no evidence that the wife had syphilis, and if she did not the children could not have been infected. It is possible, but very unlikely, for a congenital syphilitic to reach the age of 25 without showing any clinical or serological signs of the disease. In the case of the two sons in question no further precautions seem to be necessary.

Sweating Hands

Q.—*Is there any method of controlling excessive sweating in a 24-year-old patient who suffered from pulmonary tuberculosis and has made a good recovery? The sweating, which he has had all his life, is proving a disability in his work (watchmaking). Could you suggest general or local measures which can be continued indefinitely?*

A.—It is assumed that this sweating is independent of the pulmonary tuberculosis and particularly affects the hands. In that case it is almost certainly emotional and may have a psychological cause amenable to psychiatric investigation and treatment. Symptomatic treatment—such as phenobarbitone

gr. ¼ (16 mg.) thrice daily after food and tincture of belladonna m 10 (0.6 ml.) thrice daily—may help. In extreme cases sympathectomy has been successful. Local measures are not very effective, and strong solutions of formalin or acids are not to be recommended. Soaking the hands in a 10% solution of sodium hexametaphosphate or 1% aluminium acetate has a temporary effect. Superficial *x*-ray therapy in fractional dosage (150 r units unfiltered, at 90 kV, repeated at monthly intervals to a total of six treatments) may be tried, but should not be pursued if not effective, and such a course should not be repeated.

Adolescent Gynaecomastia

Q.—*Is there any satisfactory hormone therapy for a 16-year-old boy who since puberty has had a mild degree of bilateral gynaecomastia?*

A.—Although such a gynaecomastia is regarded as a transient physiological phenomenon, it may be of sufficient duration to become pathological. The writer has found that testosterone or methyl testosterone is effective in this condition, either by itself or reinforced by local inunction.

Pethidine and Glycosuria

Q.—*Does pethidine reduce the metabolism of glucose? One night I was called to a woman of 40 with violent spasmodic bladder pain due to acute cystitis. I prescribed two 50-mg. tablets of pethidine to be taken at once and one hourly until relief was obtained. Three tablets in all were taken. The next morning freshly voided urine reduced Benedict's qualitative solution +2; the evening urine contained no sugar. If glucose occurs in the excipient for pethidine tablets (which weigh only 2 gr.: 0.13 g.), it is hard to believe that the amount contained in three tablets could affect the metabolism of a woman of 40.*

A.—The glycosuria was probably caused by the acute cystitis, which lowered the sugar tolerance. The best-known instances of this are the glycosuria which occurs with boils, carbuncles, or gangrene of the toe. It probably means that the sugar tolerance is already reduced, and infection lowers it still more. A sugar-tolerance test may reveal this, and in any case the urine should be tested occasionally after the evening meal in order to detect any return of the glycosuria. It is unlikely that the pethidine had anything to do with it.

Treatment of Fibrositis

Q.—*Are the drug treatment and physiotherapeutic measures now adopted in cases of fibrositis considered entirely satisfactory? Can you summarize the recent discoveries in such treatment and that found most effective in (a) subacute (say three to six months) and (b) more chronic cases? What special treatment, if any, is suggested when the fibrositic process involves a nerve sheath, causing neuritis?*

A.—The difficulties posed by this question are largely linguistic. The term "fibrositis" is used to describe pain in connective-tissue structures and in muscle for which no cause is apparent. Gowers originally suggested that these pains depend on focal inflammatory changes in fibrous tissue, and morbid anatomical lesions were postulated. These visionary lesions were accepted until recent years as the true basis for "fibrositis." It is becoming recognized now that "fibrositic" pains have many different causes. In many cases the symptoms are psychogenic; in some they depend on minor mechanical insults to tendons and ligaments; in some localized muscle spasm is responsible; in others herniation of fat lobules through connective-tissue planes gives rise to the pain. The concept is purely a "symptom-complex." Obviously there can be no routine treatment for symptoms which may originate in so many different ways, and, because this is not generally appreciated, results are notoriously unsatisfactory. It is more true of this complaint than of most to say that there is no "fibrositis," there are only fibrositic patients. It follows from these observations that treatment depends on an exact assessment of the cause of the pain in the particular patient in point. The problem is excellently considered by Copeman in Fletcher's *Medical Disorders of the Locomotor System* (Edinburgh, E. and S. Livingstone, 1947).

NOTES AND COMMENTS

Paper-eating Infant.—Dr. I. G. WICKES (London, E.C.1) writes: The proposition that paper eating by a child aged 2 ("Any Questions?" Oct. 23, p. 768) is due to a "phase of over-emphasized disgust at his own excreta" and that it is "likely in the logic of infancy to represent inner cleanliness" seems to me to be carrying Freudian principles to a ridiculous conclusion. Though this of course is merely a matter of opinion, yet it might be possible to refute the hypothesis absolutely if in fact this particular baby was cleaned up after defaecation by means of napkins and cotton-wool instead of toilet paper at the start of the trouble, which is often the routine at 8 months. Allowing for a moment, however, that this may possibly be a reasonable explanation for his pica, let us proceed to examine the treatment prescribed. Reference is made to the avoidance of all food suggestive of faeces in appearance, but it seems to me that on the history supplied it would be just as legitimate to argue that the baby derived pleasure from eating paper because of its appreciated association with excreta, and hence the most likely way of weaning him on to a more nutritious and orthodox diet would be to offer "sausages or anything brown and of messy consistency" at every meal.

Surely psycho-analytic theory has forced us into an absurd position here without in any way helping with the treatment. It seems to me that this symptom is serious not because it denotes a deep-seated emotional upheaval but simply because it results in impaired nutrition, and for this reason drastic measures are justifiable to bring it to an end. Admission to hospital with firm and careful supervision would almost certainly be successful, though very probably some new but less harmful habit such as thumb-sucking would temporarily take its place. The Freudians would of course cite this as evidence of an unresolved conflict, but this is not necessarily true. Infants examine most new objects by putting them to the mouth, and paper may appeal because it makes pleasing crackling noises until sucked into a pulp which resembles everyday food in many respects. Since young children are by nature obsessional, this habit, so naturally engendered, may persist so potently that its forcible removal leaves a gap which must for the time be filled. If a less harmful habit appears, then there is no cause for alarm.

My reason for writing is that your contributor has provided powerful ammunition for those doctors who still despise the psychiatric approach to clinical problems. Absurd contentions such as these do immense harm and add to the heavy burden of ridicule which "trick cyclists" already have to bear.

Complications of Masturbation.—Dr. J. L. MEAGHER (Hawthorn, Melbourne, Australia) writes: I take strong exception to an inquiry under the foregoing heading (Aug. 14, p. 364). Your correspondent, citing the symptoms of a patient who practises self-abuse, asks if there is a drug which will "materially speed up" the ejaculation. The pages of the *Journal*, I take it, are not intended to serve the purposes of fostering the practices of sexual perversion. Yet one might well suppose such a result could arise from furnishing the desired information to satisfy a medical indication.

If to cure a headache, as in this case, condonation of an unnatural act is admissible, a similar justification might be claimed on not more substantial grounds in the case of other forms of perversion.

In printing the inquiry in the form you have done you lay yourself open, in my opinion, to a charge of publishing an obscene libel. A letter of protest from me concerning similar matter printed in the *Journal* some five years ago took, I think, some eight months to achieve publication. I trust that the time-lag in this case will not be so considerable.

*** The practitioner who put the question evidently was in need of advice on how to deal with this problem, and the answer briefly went into the possible psychological causes of masturbation. We would draw Dr. Meagher's attention to the following extract from the answer: "One would like to ask for what reason this patient has to resort to this habit rather than finding more natural forms of expression in adult love. Masturbation may itself be a neurosis, and, as in many cases of neurosis, the symptoms complained of may be an expression of the healthy and normal part of his personality rebelling against the more abnormal expression of his sexual instinct."—ED., *B.M.J.*

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone.
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